AMERICAN DYESTUFF REPORTER

"Circulated Everywhere Dyestuffs Are Used"

Published by Howes Publishing Company, 90 William Street, New York.

Devoted to the practical application of dyestuffs in all industries; especially to textile chemistry—the science and practice of scouring, bleaching, dyeing and finishing.

VOLUME XVI | NEW YORK, JUNE 13, 1927 | No. 10

The Role of Chemistry in the Fur Industry*

How This Country Became the Leader in Fur Dyeing—Introduction of the Aniline Black Process—Processing of Rabbit Skins and Imitations—Importance of the Fur-Bleaching Process—Chemistry's Part in Future Developments

By WILLIAM E. AUSTIN

ALTHOUGH fur dyeing can trace its origin to very ancient times, it is only about fifty years since it began to assume the status of a branch of industry; and it is only since the beginning of the present century that the ancient, empirical and rule-of-thumb methods and formulas of the fur dyers began to give way to processes and operations which had their basis in rational principles evolved as the result of systematic experimentation and research. The great increase in the use of furs since the beginning of the past decade has served as the impetus to the development of fur dyeing to its present status in this country as world leader.

On the other hand, the progress made by the American fur dyers during the past ten years is one of the chief factors in the continued growth of the fur trade here, a trade which annually consumes more than one hundred million skins of all kinds for fur purposes, representing in value of the manufactured articles more than $250,000,000.

About the year 1900 the situation in the fur-dyeing industry throughout the world was briefly as follows: Leipzig, London and Paris were the centers to which furs were sent from all parts of the world to be dyed. In America the industry, though existent, was virtually insignificant, for more than 90 per cent of the dyed furs used here bore the stamps of foreign dyers. The methods generally employed, even in Europe, were lengthy, laborious and not appreciably different from the processes practised fifty years prior. The dyes were mainly of vegetable origin, being wood dyes and tannins, and the colors produced on the skins were mainly black, brown and, to a limited extent, gray. The range of furs dyed was also limited to a few staple kinds. It cannot be denied that the results obtained by the dyers of twenty-five years ago were excellent, for Leipzig dye on Persian lamb and caracul, or London dye on sealskins, was justly famed throughout the world for fastness, luster and depth of color.

*Presented before the Division of Dye Chemistry at the seventy-third meeting of the American Chemical Society, Richmond, Va., April 11 to 16, 1927.

Introduction of the Aniline Black Process

Already at the opening of the twentieth century chemistry was beginning to be of service in the fur-dyeing industry. The method of dyeing sealskin (the aristocrat among furs at that time) by means of wood dyes, involving the application by hand of fifteen or twenty or sometimes more coats of dye in order to attain the desired result, was superseded by the Aniline Black process. Those who first successfully adapted the Aniline Black dye for use on furs were French chemists, and the method has since then attained great importance and very extensive use in fur dyeing. The basic principle in producing Aniline Black on furs is the same as for its use in cotton dyeing, certain modifications being necessary to enable its application by brushing the mixture of aniline salts and the oxidizing agents on to the skin at temperatures not exceeding 35 deg. Cent. Not only does Aniline Black on furs yield an extremely fast, brilliant black, rendering the hair highly lustrous and silky, but only four to six treatments are necessary as compared with four times as many required by the older method. Aniline Black is to-day used in the production of the so-called Hudson seal, which is muskrat dyed in imitation of dyed seal. The tremendous vogue for Hudson seal in recent years, calling for the use of millions of muskrat skins annually, made an article of value of the skin of an animal which at one time was hardly worth trapping. It is the excellent properties of the Aniline Black dye used which contributed to the establishment and continuance of seal-dyed muskrat as the staple among furs.

The introduction of the oxidation type of fur dyes, intermediates which are developed into colored products on the hair of the fur by means of oxidizing agents, immeasurably broadened the field of fur dyeing, and really is the factor most responsible for the development of modern fur dyeing. The idea of the oxidation colors for furs was advanced first by a German chemist as far back as 1888, but so great was the resistance and opposition of the fur dyers to the innovation that it was nearly twenty years before the more progressive dyers were converted to the oxidation colors, and it is a surprising fact that in America the new type of dyes was introduced before the German dyers used them. The oxidation colors offered simple, quick and facile means of obtaining shades which formerly required lengthy and laborious operations. At first the colors produced were the brown, black and gray similar to those previously made with the wood dyes. Within a short time, however, the range of available colors was greatly increased, until to-day practically every color of the spectrum is included, comprising about forty individual dyes of the oxidation type.

With the increase in knowledge and experience of the oxidation colors and the manner of their application to the various fur fibers, the fur dyers became bold, and subjected to the dyeing process many classes of furs which no one before ever dreamed of dyeing. To-day there is scarcely a class of furs which has not served as material for the fur dyers' skill and ingenuity in applying colors or producing novel effects. Even the white ermine, ever the fur of kings, and the sable, the king of furs, have succumbed to the yoke of color applied by the master of fur dyeing. Fashion has impressed the fur dyer into its service, so that there is now available the greatest possible variety of colors and color effects on a great range of different furs. Every conceivable color of the spectrum with all the tints and shades, ranging from the palest ivory to the deepest purple, has found a home on some fur. The color cards of the textile dyers have come to be the guide of the shades available on furs each season.

Processing of Rabbit Skins and Imitations

In many instances dyeing has not only made a thing of beauty of a naturally unattractive-colored fur, but it has given value to classes of furs which were practically unsalable or had little market in the undyed state. The dyeing of imitations of the rare or more expensive furs on skins which have similar characteristics but are much cheaper has attained a high degree of perfection. The production of a Russian sable color on kolinsky, of a blue fox on white fox, of a silver fox on red fox are but a few examples of highly artistic imitations developed by the fur dyer. It has not infrequently happened that the dyed imitation proved to be more attractive than the fur imitated.

One important branch of the fur-dyeing industry which deserves special mention is that which is concerned with the dyeing and processing of rabbit skins. Between fifty and sixty million rabbit skins are used annually for fur purposes, more than all other kinds of furs together, and the majority of the rabbit skins receive some kind of dyeing treatment. Almost every conceivable imitation of more valuable fur has been produced on the rabbit skin, as well as all the fancy shades. The Aniline Black dye is also used on the rabbit, which is first sheared, to produce an imitation of dyed seal, and the rabbit-seal has attained as great a vogue among the lower-priced furs as Hudson seal or seal-dyed muskrat. The work of the fur dyers on the rabbit fur is responsible, probably more than any other factor, for the popularization of furs to the extent that, with certain obvious exceptions, furs must now be considered as belonging to the class of essential and necessary articles of apparel rather than as luxuries. The versatile bunny, aided and abetted by the fur dyer, has made it possible for the purchaser of moderate means to obtain a fur garment which is attractive in appearance, reasonably serviceable as to wear, within reach as to price, and up to the minute so far as the fashionable shade or color effect is concerned. The rabbit skin, by reason of its practically unlimited supply, its cheapness, its adaptability to the most varied dyeing treatments and its reasonably good wearing qûalities, which modern methods are continually improving, seems most likely to become the staple fur of furs.

Importance of Fur Bleaching Process

Not content with the unique and individual methods and processes which the dyeing of furs requires, the fur dyer has turned to the textile dyer for new ideas to be used on furs. As a result, there have been produced on furs novel effects, such as printed designs and stenciled effects, simulating on flat-haired furs the markings of the tiger, leopard, giraffe and even alligator. Ombre effects and multi-colored dyeings, produced either by etching or stripping in parts the color from dyed skins or by superimposing several different dyes on different parts of the same skin, have all found successful application.

Probably the most revolutionary achievement in the history of fur dyeing was the successful development, several years ago, of a process for bleaching naturally dark furs, so that they could then be dyed shades similar to those formerly obtainable only on white furs. The bleaching of dark furs had always been a desideratum, but it was a problem that baffled the fur dyer. Various attempts at bleaching had failed because either the leather was ruined or both the hair and leather were affected. The popularity of the light fancy shades, combined with the relatively limited supply of white or light-colored furs, made the fur

dyers all the more eager to develop a method of bleaching the darker furs so that the leather would remain sound and the hair unimpaired. It was the culmination of a long period of intensive and extensive experimentation by the chemical staff of one of the fur dyers when the much sought-for result was finally achieved. The method as first developed (and patented) did not permit of a dark skin being bleached to a white, but only to a light buff color; which, however, did not prevent the bleached skins being dyed most desired shades. The success of the first bleaching process led other fur dyers to experiment along similar lines, and as a result many improvements and new methods have been evolved. Very recently black furs have been bleached to a pure white in the laboratory, preserving all the good qualities of the hair and leather. It is only a matter of time when the production of white on a commercial scale will be an actuality. White can now be made black, and black will be made white. The query of the prophet, "Can a leopard change its spots?" can now be answered in the affirmative. In fact, not only can the leopard be made to change the color of its spots, but it can be made to lose its spots, and can then be converted to an imitation tiger.

The foregoing has been somewhat in the nature of an account of the developments in the fur-dyeing industry, but underlying these developments there can be discerned the ever-increasing application of the principles of chemistry, theoretical and applied. Perhaps more so than any other kind of dyeing, fur dyeing is essentially a chemical industry, inasmuch as its fundamental processes involve highly complicated chemical reactions. As is usually the case, the art of fur dyeing has advanced much more rapidly than the science. From the scientific and technical aspects, fur dyeing has vast possibilities, because the field is wide and has been but little investigated. The future development of fur dyeing will undoubtedly depend upon the extent to which science, and especially chemistry, is called upon to serve.

The Purpose and Practice of Souring

Part II—Properties of Individual Sours

A Discussion of the Action of the Various Acids on Textiles, with Some Consideration of Their Relative Merits for the Purpose.

By F. H. GUERNSEY

Chief Chemist, Cowles Detergent Company

Acetic Acid

ACETIC ACID is an organic acid of considerable utility in textile souring. The pure acid will crystallize at 62 deg. Fahr., but in commercial practice the 55 to 56 per cent solution is more common. When water is added to the pure acid, its specific gravity rises, and with further addition falls again. The 56 per cent acid has the same specific gravity as the pure acid.

Acetic acid is a good neutralizer for alkali, forming sodium acetate as a by-product. Sodium acetate is a crystalline material, very soluble in water and melting at about 137 deg. Fahr. Normal quantities of it, it retained in the goods, will not produce any complications, but larger amounts arising from strongly alkaline water or poor rinsing alkali-builders will char slightly at the temperature of ironing and produce a brown or yellow discoloration, accompanied by the formation of alkali.

Acetic acid will not dissolve iron stains, but it will clear most of the other acid-soluble stains.

It is excellent for dissolving lime and magnesium soaps (by decomposition) and is therefore valuable in clearing grayness from that source.

By virtue of its acid value, acetic will combine with the hypochlorite—i. e., ordinary chlorine bleaches—and bring about their decomposition. It has no opposite (reducing) bleach action, and therefore does not function in bleach decomposition in that manner. It has no power to bleach by chemical reduction. This acid is used extensively in preparation of the bluing bath and is well adapted for the purpose.

The fact that acetic acid has practically no damaging effect upon fibers and colors is of great importance. It is driven off or vaporized by the action of heat in ironing.

A strong solution of acetic acid, at the temperature of boiling, followed by ironing, may produce a "scroop" effect upon cotton, but is not so active in this respect as oxalic.

Owing to a rather unpleasant odor, the practice of leaving acetic acid in wet wash or other unfinished goods is being rapidly abandoned.

Oxalic Acid

Oxalic acid is a solid crystalline substance, melting at the boiling point of water. It is a much stronger

acid than acetic acid, but is rather slow to dissolve in water. This unfortunate factor is of importance in connection with its use in textile processes.

Oxalic acid is an excellent neutralizer of alkali, but the sodium oxalate formed is even less soluble in water than the acid itself. When a limited amount of oxalic acid is used, an acid salt having destructive properties may be formed.

Oxalic acid will decompose lime and magnesium soaps, but the lime or magnesium salt formed in doing so is not soluble in water (as is the case when using acetic acid) and the gritty deposit may be left in the goods to affect the feel of the goods and injure its mechanical strength.

One of the greatest values of this sour lies in its ability to remove various stains. It is an excellent iron stain remover, and by its chemical reducing power a reducing bleach, which is particularly effective upon many stains, is secured. In decomposition of chlorine bleach it has a double action due to acidity and reducing (the opposite to oxidizing) power.

Oxalic acid is a favorite of many in connection with the bluing operation. With the basic or "sour" blues it is noted for its ability to fix an even shade and hold it. It is believed that this property is due to a tendency of oxalic acid to form oxycellulose, which has a strong attraction for the basic colors. In fact, a basic color or dye may often be detected by its attraction for oxycellulose.

The most serious obstacle in the path of oxalic acid as a textile sour is its destructiveness to fiber and color. This is further aggravated by its poor rinsing properties mentioned above. The damage wrought in the act of souring is secondary to that produced when the acid is dried in the fiber and subjected to the heat and pressure of ironing. It may be safely stated that any amount of oxalic acid which may be detected will produce serious losses of tensile strength during the ironing process. Traces of oxalic acid remaining in the goods will produce the familiar "crunch" or scroop in the goods. Oxalic damage is a common cause of collar cracking. Unfortunately, this sour is not driven from the goods by the heat of ironing. It is non-volatile under those conditions and remains in the goods as a destructive agent.

Sulphuric Acid

This acid is a strong liquid mineral acid, obtainable upon the market in various strengths. When the strong acid is diluted with water, there is a sudden liberation of heat, making this operation a more or less hazardous one. When diluting the acid with water, the acid should always be poured into the water in a thin stream with constant stirring. Water should never be poured into the concentrated acid.

As a neutralizer for alkali, sulphuric acid is very efficient, and the non-destructive sodium sulphate is formed as a by-product. It is also efficient in breaking up lime soap deposits, though the calcium sulphate formed is not very soluble. Sulphuric acid is commonly used to clean up wash wheels which have become coated with these heavy metal soaps.

It is an excellent stain remover, though it has no reducing properties. It is effective upon fresh iron stains, but, generally speaking, oxalic acid excels in this application.

Sulphuric acid is a valuable aid in bluing and, in fact, is largely used in dyeing processes to promote dissociation of the dye substance. The strong acidity will rapidly bring about decomposition of chlorine bleach. The strength of this acid, or, in other words, the hydrogen ion content of its solutions, is so great as to be extremely destructive to cotton. Although sulphuric acid is very soluble, it clings to the fiber by adsorption and produces "acid patches." Parchment paper is prepared by the action of sulphuric acid upon cellulose.

Many cases of fabric destruction by the acid, and acid vapor from household radio batteries, have been reported. In several instances sulphur-oxidizing bacteria have been known to produce sulphuric acid in fabrics with damaging results. Very often—in fact, in most cases—the damage due to the drying-in of sulphuric acid is not apparent until the fabric is placed in water or touched by a heated iron. In many cases, the concentration is strong enough to produce a charring of the goods.

Sulphuric acid is destructive to many colors, and as it does not evaporate at ironing temperature the heat of ironing drives out only the water, leaving the acid to concentrate in the goods.

There are two solid forms of this acid commonly found on the market, and both are sometimes used as sours. The more common of these two is niter cake, which is a mixture of sodium acid sulphate and neutral sodium sulphate. Niter cake is equivalent to about one-third its weight of sulphuric acid. That is, 10 pounds of niter cake is equivalent to 3 1/3 pounds of sulphuric acid. From the standpoint of textile souring, the properties of this niter cake are identical with those of sulphuric acid.

The other source of sulphuric acid is aluminum sulphate. When this material is dissolved in water, sulphuric acid and aluminum hydrate are formed. The acid acts as a sour, but the cloth fiber absorbs considerable of the aluminum hydrate, with the result that repeated treatments will bring about discoloration and precipitation of insoluble aluminum soap in the fabric

Muriatic Acid
(Hydrochloric Acid)

This is another strong mineral acid having much the same general effect as sulphuric acid in textile souring. It is a better iron solvent, has no reducing

action and is more volatile. It is very destructive, however, and a great rust developer.

Aluminum chloride, often used as a deodorizer, yields hydrochloric acid upon being dissolved in water and hydrolyzing, and is very destructive to fabrics. Clothing worn by women thus frequently develops holes in tendered areas due to this reaction of the deodorizing materials used.

Hydrochloric acid is not as satisfactory as the above sours for blue fixation.

Hydrofluoric Acid Sours

Under this heading we have: (a) Hydrofluoric acid itself; (b) the acid salt, or sodium acid fluoride; (c) the neutral sodium silico fluoride.

Textile sours containing the acid and acid salts in their composition are protected by U. S. Patent No. 1,016,928 to Bishop, and the proprietary sour Erusto Salts is prepared under this patent.

Hydrofluoric acid will attack glass, and is therefore usually supplied in wood, wax or hard rubber containers. The acid itself is too difficult to handle under average conditions of textile souring, and, as a result, the acid salt, sodium acid fluoride, is the most popular of the series.

The sodium silico fluoride is a neutral salt, but has the property of absorbing alkali. In one sense this is similar to a neutral fat-absorbing alkali. Only in this way, however, does the sodium silico fluoride function as a sour. It is not acid in reaction itself.

The acid and acid fluoride will neutralize alkali, forming the neutral and inactive sodium fluoride as a by-product. They will also decompose lime soap, forming insoluble fluorides and free fatty acids. Their acidity will take care of bleach decomposition, and satisfactory results are produced in bluing.

These sours (the acid and acid fluoride) are characterized by their safety toward fabrics and colors, and excellence in iron stain removal. In this latter effect they are perhaps not quite the equal of oxalic acid, but they meet the demands of practical application. The sodium silico fluoride will not dissolve iron stains, and this point should be clear in one's mind. Sodium silico fluoride is also soluble with considerable difficulty, while the acid and acid salt are very soluble in water. The two latter sours are the only sours available which will dissolve iron stains and yet be harmless to the fabric even though left in the goods.

None of these sours has any reducing bleach action, but they are inodorous and, since they are harmless to fabrics and color, they may be allowed to remain in the goods to correct the difficulties attending the use of alkaline water for rinsing. The heat of ironing will evaporate most of the acid portion of the compound and no harmful effects will result.

Sodium Bisulphite

This is a solid acid salt of sulphurous acid (not sulphur*ic* acid). It is weakly acid and will absorb alkali to form the normal sulphite.

Sodium bisulphite, however, is an unstable compound, and often suffers decomposition under the conditions of textile souring. The separation of free sulphur, which often occurs, is detrimental and stain-forming. Occasional formation of sulphides will result in development of dark stains from iron, etc.

Sodium bisulphite has practically no action on lime soap, but exerts a reducing bleach action. In this manner it often proves a good stain remover, but it frequently happens that upon exposure to air the stain will redevelop, due to atmospheric oxidation. Sodium bisulphite is frequently used to bleach wool and silk (where the use of chlorine bleach is prohibitive), but the results are not as permanent as those obtained in the peroxide bleach.

Sodium bisulphite is detrimental to most blues, the tendency being to discharge or bleach out the color of the bath. It is also more or less destructive to dyed colors, but has no destructive action upon the fiber. Heat will volatilize the acid principle without damage to the goods.

Its principal value appears to be as a destroyer of chlorine bleach. Its opposite (reducing) action makes it efficient for this purpose. It is not a solvent for iron stains, though it may, by reduction, lessen the depth of shade of fresh stains.

Lactic Acid

This is another organic sour, appearing on the market as a syrupy liquid. It is a good neutralizer of alkali and lime soap. All the by-products of such chemical action are soluble in water. It is quite strongly acid, falling, say, between oxalic acid and acetic acid. It has some reducing action, and is an excellent stain remover and bleach neutralizer. It has fair solvent action upon iron stains and approaches oxalic acid in blue fixation. When concentrated in the goods it has moderate destructive action upon fibers and colors. However, as it is extremely soluble the rinsing problem is a simple one, and the danger of carrying over lactic acid is very remote. It is not vaporized readily at ironing temperature, but if present in reasonable quantity inflammable vapors will be driven off. Lactic acid is one of the best acids obtainable for textile souring.

Boric Acid

This is a very mild acid, rather difficultly soluble but possessing some virtues as a sour. This is chiefly as a medium by which the goods may be safely left in an acid condition, and through its antiseptic proper-

ties goods so treated will resist bacterial action and mildew formation. It is too weak an acid to effectively carry out the other functions of souring, but may be mixed with acetic acid or lactic acid to advantage.

Proprietary Sours

Aside from the patented composition mentioned above, there are many proprietary sours on the market consisting of mixtures of various acids or acid salts. Unless one is sure about the behavior of these latter materials, some extra caution should be exercised, because many of these compounds contain sulphuric acid or oxalic acid, and they must be used accordingly. Some of these contain salt or other material for purposes of blue fixing.

Attempts have been made to temper the action of the strong acids by the use of so-called buffer salts of the same family as the acid. For instance, sodium sulphate is used with sulphuric acid, sodium chloride with muriatic acid, sodium oxalate with oxalic acid, etc. Many organic materials, such as gelatin and gums, have also been employed to reduce the hydrogen ion content of the solutions of the strong acids. The general results obtained, however, have never been satisfactory or produced a genuine protection for the fiber without seriously lowering the efficiency of the acid in its intended functions.

A somewhat similar case is seen in connection with the use of sodium bicarbonate to buffer down the burning effect of the caustic liberated from soda ash. The products thus formed (modified sodas) are not right, because the buffer (bicarbonate) is unstable and is quickly converted into soda ash itself. As long as the bicarbonate remains unchanged and acts as a buffer, the activity of the soda ash is so reduced that large quantities of the material must be used to produce a cleaning condition and this naturally leads to a rinsing problem.

As in the case of uncontrolled caustic soda, the strong acids are absorbed in the fiber and strongly resist rinsing. The result is a condition known as "acid patches," which appear as tender spots in the fabric.

DETERIORATION OF BLEACH STUDIED BY GOVERNMENT CHEMISTS

Mills storing bleaching powder containing chlorine will be interested to know that bleach loses its chlorine much more quickly in summer than in cooler weather. This loss of chlorine is the subject of a report issued by the United States Department of Agriculture as the result of studies of two of the department's chemists, C. C. McDonnell and Leslie Hart.

In summarizing their findings these chemists state:

"The available chlorine in most samples of bleaching powder packed in containers of the usual commercial types decreased fairly regularly during storage. Most of the available chlorine lost was transformed into chloride chlorine, the loss in total chlorine in most cases and the change in chlorate chlorine being very slight.

"There was no marked difference in the rate of deterioration between the samples manufactured and packed in the winter and those manufactured and packed in the summer. There was, however, a seasonal variation, the loss of available chlorine being greater in warm than in cold weather.

"In general, the keeping qualities of the bleaching powder were not greatly affected by the type and size of commercial container. There appeared to be a small difference in favor of the larger metal containers over the other commercial packages. The material stored in tightly stoppered glass bottles deteriorated slightly less than that stored in cans.

"Two of the samples of bleaching powder packed in the summer showed about the same rate of deterioration as the others for the first nine months. After that the rate of deterioration increased rapidly and was accompanied by a decided increase in the moisture content. This may indicate that the absorption of water catalyzes the change.

"The results on the rate of deterioration as affected by the method of packing did not lead to any definite conclusions. The hand-packed material put up in the summer showed a high rate of loss after about ten months. As one of the machine-packed samples also showed a high rate of loss during the same time, however, this cannot definitely be attributed to the method of packing.

"The visible rays of light seem to have a slight accelerating effect on the loss of available chlorine.

"The average loss in available chlorine for all samples from the different sources, packed and stored in various ways, was 1.08 per cent per month for the period covered, twelve to fifteen months, the average for the hottest months (May 15 to September 15) being 1.44 per cent per month and for the coldest months (November 15 to March 15) 0.61 per cent per month."

THE I. G. BUYS SPANISH FIRMS

It is reported, says a dispatch from Commercial Attache Cunningham, Madrid, that the Compania Nacional de Colorantes y Explosivos has been acquired either in its entirety or in the control of its administration by the German I. G. Farbenindustrie. The Flix dye factory no longer belongs to the Sociedad Electro-Quimica, and has been sold to the Compania Nacional de Colorantes y Explosivos. Azo and Sulphur Black dyes are being introduced. Production is about half of the capacity. Approximate annual production is 300 tons azo dyes and 400 tons Sulphur Black. The Compania Nacional has a factory in Barcelona which produces intermediates in larger quantity than required for the domestic market.

A Proposed New Food Dye

By H Johnson and P. Staub
Color Laboratory, Warner Jenkinson Co., St. Louis, Mo.

THERE are at present two green dyes on the list of certified colors which are permitted to be used for coloring foodstuffs and beverages under rulings issued by the United States Department of Agriculture. Officials of the Bureau of Chemistry in charge of the division covering the use of food colors are now considering the admission of a third green dye to the permitted list. This is a new substance and has been named Fast Green FCF. It has passed the physiological tests required by the Department of Agriculture of coal-tar bodies to be used as coloring in foods.

Fast Green FCF belongs to the triphenylmethane group of acid dyes and is similar in general composition to Light Green SF Yellowish and Guinea Green B, the two green colors already on the permitted list. The leuco bases of all three dyes result from the condensation of two molecules of ethylbenzylaniline monosulphonic acid with, respectively, one molecule of benzaldehyde or a derivative of benzaldehyde—thus,

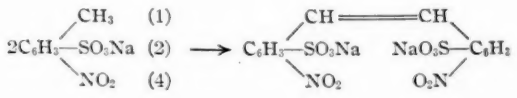
Guinea Green B	Benzaldehyde
Light Green SF Yellowish	Benzaldehyde p-sulphonic acid
Fast Green FCF	p-Hydroxybenzaldehyde o-sulphonic acid

Investigation has shown that Fast Green FCF is a fast, non-fading dye when used in foodstuffs and beverages, whereas under the same conditions Light Green and Guinea Green are subject to rapid and sometimes complete decolorization. The new dye is also more intense than the other two greens, and the manufacturer can therefore use much less of it when coloring a food product or beverage—a decided advantage.

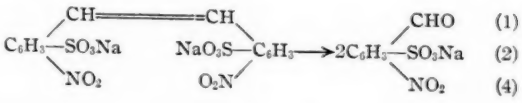
Manufacturing Process

The process commonly used for Guinea Green B is applicable to the manufacture of Fast Green FCF by substituting p-hydroxybenzaldehyde o-sulphonic acid for benzaldehyde. It consists in the condensation of one molecule of p-hydroxybenzaldehyde o-sulphonic acid, with two molecules of ethylbenzylaniline monosulphonic acid, followed by oxidation of the leuco substance obtained with lead peroxide in the presence of dilute sulphuric acid.* The insoluble lead sulphate is filtered off and the color separated by salting out.

The preparation of p-hydroxybenzaldehyde o-sulphonic acid is conveniently accomplished by starting from p-nitrotoluene o-sulphonic acid. Direct methods have been proposed for oxidizing the methyl group to the aldehyde, but the writers prefer the indirect method of first oxidizing p-nitrotoluene o-sulphonic acid to the corresponding stilbene compound in alkaline hypochlorite solution.†



This provides the sodium salt of dinitrostilbene disulphonic acid in a practically chemically pure condition, which can be converted quantitatively into two molecules of the sodium salt of p-nitrobenzaldehyde o-sulphonic acid by oxidation with potassium permanganate in alkaline solution.‡



Reduction of the p-nitro to the p-amino aldehyde is effected in the usual way by reduction with ferrous carbonate paste. The amino aldehyde thus obtained is diazotized with sodium nitrite, the resulting diazonium salt being converted into p-hydroxyaldehyde o-sulphonic acid by warming to 80 to 90 deg. Cent. with dilute sulphuric acid.

The writers have also tried out the method of condensing two molecules of ethylbenzylaniline monosulphonic acid with the aldehyde taken as described above to the amino stage. The resulting p-amino leuco substance is then diazotized and hydrolyzed to the p-hydroxy compound. The method presents several disadvantages, however. The amino leuco acid substance is relatively insoluble in water, so that diazotization must be performed in very dilute solution. Furthermore, the hydrolysis of the diazonium salt of the leuco substance does not proceed smoothly, nor is the theoretical amount of nitrogen evolved. Bright red bodies are formed that cannot be separated from the leuco base. These red substances are partially destroyed and decolorized by oxidation with lead peroxide, but their decomposition products cannot be separated from the color. The writers therefore advise against this method of making Fast Green FCF.—Industrial and Engineering Chemistry.

*Actiengesellschaft fur Anilinfabrikation, German Patent 50,782 (1889).

†Clayton Aniline Co., English Patent 5351 (1897); Levinstein, Ltd., German Patent 106,961 (1897).

‡Levinstein, Ltd., German Patent 115,410 (1897).

SALES OF FOOD DYES REACH OVER A MILLION

The United States Tariff Commission has just announced that, during 1926, 288,454 pounds of food dyes were produced in this country. Of this amount 282,347 pounds were sold for $1,115,578, the Commission said.

On April 11, 1927, the Tariff Commission published

preliminary figures on the domestic production and sales of dyes and synthetic organic chemicals. The following supplementary table shows the production and sales of food dyes during 1926:

Index No.	Schultz No.	Name of Dye	Sales		Produc.
			Quantity Pounds	Value	Pounds
10	7	Naphthol Yellow S	.....	.....	.....
22	...	Yellow AB	.....	.....	.....
61	...	Yellow OB	8,725	$16,975	.....
80	83	Ponceau 3R	.....	.....	.....
150	144	Orange I	.....	.....	36,525
184	168	Amaranth	94,143	279,178	105,993
640	23	Tartrazine	74,062	222,251	69,143
666	502	Guinea Green B	.....	.....	.....
670	505	Light Green SF (yellowish)	.....	.....	.....
773	592	Erythrosine	.....	.....	.....
1,180	877	Indigo disulphonic acid	.....	.....	.....
		Total	282,347	$1,115,578	288,454

Practical Hints on the Production of Bright Colors on Textile Fabrics

Part XXVIII

Mixtures of Sulphur and Basic Colors—Methods of Topping—Construction of the Apparatus Employed —Operation of the Plant—Its Special Advantages.

(*Continued from page 290*)

By RAFFAELE SANSONE

MANY brands of sulphur dyestuffs on the market possess satisfactory fastness to light and washing. Few of these, however, will produce bright colors, even with aftertreatments, such as steaming, chroming, coppering, etc.

In the last case the range of shades can be increased by mixing with other suitable sulphur colors, or with certain direct dyestuffs. Diamine Fast Yellow B and Diamine Orange B can be added in this instance directly to the dye bath of the sulphur colors, where no harm results from the presence of the sodium sulphide. Various other direct colors, among these Diamine Red 4B, Diamine Brilliant Scarlet S, Diamine Violet Red, Oxy-Diamine Orange G and Oxy-Diamine Orange R, may also be employed in the same manner, but only in small quantities.

The effects produced as above, however, are much below those which can be obtained by shading or topping with basic dyestuffs, this process also offering the advantage of covering impurities, such as fragments of straw, dead cotton, etc., always present in low-grade goods. Basic colors are fixed by sulphur colors to a still greater degree than with the direct or substantive colors, and the fastness of the dyeings is not impaired in any way, provided, of course, that the dyer does not use larger quantities of the basic colors than are just necessary for brightening the shades, for which purpose 0.2 to 0.4 per cent should be sufficient. In the production of the brightest shades some care is necessary in the choice of the sulphur colors used, and in the way the topping operations are carried out, as unsatisfactory or uneven effects can be produced as a consequence of the rapid adsorption of the basic colors.

The following basic dyes offer advantages for topping cotton goods dyed with sulphur colors: the Indazines, Naphtindones, New Methylene Blues, Methyl Violets, Solid Greens, Brilliant Greens, Safranines, Saraphosphines, Thioflavine T, Methyl Blues, Nile Blues, Marine Blues, Victoria Blues, Night Blues, Chrysoidines, Vesuvines, Reonines, Auramines, Eucrysines, Flavindulines, Fuchsines (Magentas), Rubines, Crystal Violets, Ethyl Violets, Water Blues, Diamond Greens, Malachite Greens, Acridine Yellows, Indol Blues, Methylene Blues, Bismarck Browns, etc. Among the basic dyestuffs that are less often employed for topping sulphur colors are: Indoin Blues, Victoria Blues, etc. These require the use of a boiling bath with the addition of a little alum or sulphate of alumina.

Different Methods of Topping

The topping of cotton fabrics dyed in sulphur colors can be conducted in several ways:

1. In the dye bath with the sulphur colors.
2. In a separate water bath without additions.
3. In a bath containing acetic acid.
4. In a bath containing sulphate of alumina or alum.
5. In a sizing bath.
6. In a soaping bath.
7. In the coppering or chroming bath, etc.

Topping is very rarely conducted in the same dye bath in which the goods are dyed with the sulphur coloring matters, as an excessive quantity of the basic dyestuffs would result from a portion being absorbed by the unfixed color remaining in the dye bath. The colors most recommended for use with a similar simultaneous dyeing and topping process are: Rhodamine B, Rhodamine G, Rhoduline Red G, Rhoduline Brilliant Red B, Safranine FF Extra, Auracine G, Chrysoidine, etc.

When a cheap topping is desired and the same bath is used several times with the idea of better utilizing the basic colors, the thoroughly rinsed cotton cloth goods are treated in a plain water bath without any addition whatever, using this either cold throughout or slightly warming towards the end of the treatment. In this instance a dilute solution is produced, and this is added in several portions to the topping bath. It should be stored away after use in such a manner that no other coloring matter can affect it and that it does not come in contact with alkaline or acid baths.

A continuous dyeing machine will serve very well for the purpose, especially if constructed on the principle shown in Fig. 1.

Construction of the Apparatus

This shows a broad washing machine, having a heavy rectangular wooden vat E, composed entirely of carefully seasoned and cut wooden planking, joined together so as to form smooth water-resistant walls, painted over with oil paint or otherwise covered for resisting the action of the different corrosive agents in the atmosphere. Vat E contains three let-off tubes on one of its longer sides, joined to a single tube, but controlled each by a separate tap or valve, it reposes on several low wooden feet at a small height from the flooring of the works, and air can circulate freely below its bottom. The interior of vat E is divided by closed wooden partitions into three compartments of about equal size, each of which contains several upper and several lower guide rollers of wood, glass or other suitable material.

On the outside of vat E, and at a short distance from its walls, is placed a solid cast iron frame N, which surrounds the former, which is thus enclosed in a sort of cage. Through this arrangement the vat is kept in good condition for a long period, for the reason that it does not receive the oscillations caused by the passage of the cotton goods. Besides this the machine is driven more quietly, and without rubbing or friction, as it is equipped with solid bearings.

The portions of frame N which remain close to the larger walls of vat E contain three pairs of upper pro-

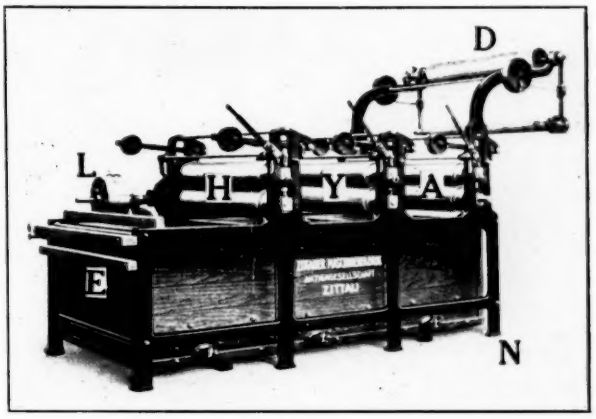


Fig. 1.

longations, having internal channels with bearings supporting the short end-shafts or three pairs of pressing rollers H, Y and A, kept under a light pressure through levers and weights which, however, can be eliminated by raising the upper rollers for a small interval by hand levers.

In some machines the upper rollers are of India rubber and the lower of copper-plated iron, while in others wooden rollers are preferred all through, and in still others an upper wooden and a lower copper-plated iron roller are used. Certainly the wisest plan is to use a lower copper-plated iron roller and upper India rubber roller, as the material is more evenly pressed in this last case, and the dyestuff solution left on the rollers can be easily washed off.

The end of framing N also contains two high cast-iron arms, on which works a cloth-plaiting mechanism D, having two side-discs, a swinging arrangement, connecting-rods, etc.

Before vat E are arranged three wooden bars, one of which is often covered with a brass plate having lines in opposite directions.

The plant is driven in this instance by a pulley L, under the action of a leather belt, working from the pulley of an upper or lower transmission, or directly from the pulley of a small electric motor.

At a sufficient height behind vat E is arranged a large copper-plated iron vat. This has three separate tubes and taps, by which the topping bath can be delivered simultaneously and separately into the three compartments of vat E, or only into one of the same. It is placed for the purpose on a white brick walling or on iron legs.

In the pavement just below the machine are arranged several cement collection troughs, each destined for the storage of a separate old topping bath.

Such troughs are covered with wooden planking, contained in iron guards.

Operation of the Plant

Before starting work on the above plant, the interior of vat E is well washed with a little weak soda lye, using a large brush with wooden bristles. When all old color has thus been eliminated, the lye is run off, clean running water is entered, and the three outlets at the bottom of vat E are opened. The brush is used for some time for rubbing the squeeze cylinders H, Y and A, the inner walls of vat E, and different binding rollers. After this the water is allowed to run through for a few minutes, being then closed off, as are the three outlets of the vat when the latter is quite empty.

The ends of two strong hemp ropes are then entered through the wooden bars in front of the machine, these passing from here to the binding rollers in the first compartment, through squeeze rollers H, to the guide rollers in the second compartment, through pressing-rollers Y, on the binding rollers in the third compartment, through squeeze-rollers A, and up to the plaiting-device D, from which they are left to hang. To facilitate the entrance of the strings the upper rollers are raised by moving the hand-levers already indicated, being, however, lowered as soon as the threading process has been completed.

The two strings are kept apart, and are made to occupy a slightly wider space than that which will be taken up later by the pieces of dyed cotton cloth to be treated. The ends of the strings are then joined at the extremities of the beginning of the first piece of dyed cotton cloth, and the topping bath is prepared in the raised vat at the back of the plant, by pumping in from one of the lower storage cisterns an old bath left from a preceding treatment, increasing its volume with water and adding more basic color solution, until the contents are sufficient for producing a coloring of the required intensity.

Once prepared, the topping bath, the tubes and taps at the bottom of the raised cistern are opened to cause the bath to flow with equal rapidity into the three compartments of vat E. In this way these are soon filled to three-quarters. The entrance of the treating-fluid is then suspended, and the machine started by moving the leather belt from the loose to the fast pulley. The strings are thus pulled forward by the squeeze rollers, and with them the beginning of the cotton cloth is gradually entered and carried through the apparatus, passing from bath to bath, and receiving the desired degree of topping.

As the beginning of the cloth leaves plaiter D, it is deposited on a small wagon or truck running on four wheels, and here piece after piece is formed. When one truck has been filled, an empty truck replaces it, after having unsewn the end of the last piece of the lot just placed on the first truck. As the end of one piece is approaching, the beginning of another is sewn on, the operation continuing as long as there is material to be treated. When all the dyed cotton cloth has been treated as above, the small wagon containing it is pushed to the drying department of the mill.

Special Advantages of the Plant

The plant possesses several important advantages for topping with a water bath having no additions whatever beyond that of the basic color. Among these the following are of greatest interest:

1. The cotton cloth, dyed with the sulphur colors, can be treated with three separate topping baths, being pressed in each case, assuring a uniform impregnation and coloring all through; also with dark topping or shading baths.

2. If the number of topping liquids used in the mill is reduced to six or to ten at the utmost, all old baths can be stored away when not utilized after the treatment of each lot of material, and used again, without impairing in any way the quality of the desired shade. This is of importance in the case of heavy toppings, when strongly charged baths are employed which it would be wasteful to throw away.

3. By regulating the speed of the topping fluids, running through the three compartments of vat E, it is possible in some cases to exhaust completely the topping bath, before the material leaves the last compartment of vat E, delivering it into the waste-water main without loss of dyestuff.

4. The dyed cotton cloth can be treated with three separate topping baths one after the other, or three times with a single topping bath.

5. Through the possibility of using the same topping bath three times, before delivering it to the waste-water main or into one of the storage cisterns, the topping operations can be conducted very rapidly.

6. With many topping baths, by the time the material reaches the last pressing rollers A, most of the basic colors have been exhausted from every portion of the material, and this has received the degree of treatment that may be necessary, etc.

ALBERT BLUM SUCCEEDS DR. HUNZIKER

Albert Blum, treasurer of the United Piece Dye Works, has been elected to the board of managers of the Silk Association of America, Inc., to succeed the late Dr. August Hunziker. As successor to Dr. Hunziker in the Textile Alliance, the association's executive committee elected Horace B. Cheney to be its representative.

Further action of the committee at its recent meeting was to elect four new members: M. J. Frank & Co., Inc., Keystone Piece Dye Works, Pelz, Greenstein Company, Inc., of New York City, and the Ullman Levinthal Silk Corporation, of Paterson, N. J.

SIZING OF COTTON YARN

A RECENT issue of the Journal of the Textile Institute contains an interesting discussion on some work done at the Shirley Institute on the sizing of cotton warp yarns.

As many of the variables that occur in ordinary yarn were eliminated so for as possible in their experiments, one mixture of cotton was spun to the same count with various degrees of twist. This, of course, influenced the diameter of the yarn and its ability to absorb the size. This difficulty was overcome by calculating the space occupied by the cotton itself. It was found that the capacity for taking up the size was influenced by the twist, for example, when the turns per inch of twist of two 16s yarn were 12.4 and 15.9, the respective amounts of size taken up were in the ratio of 122 to 100. The conclusion was that the influence of twist on sizing is not sufficient to cause slight accidental departures from the normal twist to have any considerable effect on the average amount of size taken up by the warp.

With a series of similar yarns ranging from 8s to 36s, the amount of size taken up is greater the finer the counts. Other kinds of yarn up to 80s followed the same rule so long as the comparison was confined to one mixing of cotton. This behavior is not in accordance with the expectation of many experienced sizers, but occurred quite consistently through their experiments. Fine warp yarns, however, are commonly prepared from a finer grade of cotton than are the coarse, and it was found that the finer staple cottons were less receptive of size than the others.

Influence of Yarn Surface

The fact that fine yarns size more heavily than coarse was attributed to the part which the surface of the yarn plays in sizing. It is not possible to define the surface area or surface condition of the yarn with sufficient exactness to permit of a precise relationship being developed between the extent of the surface and the amount of size taken up. It was found that the fact that the extent of yarn surface determined how much size was taken up did not necessarily mean that the size remained on the surface, and in practice it is generally found to have penetrated the yarn before drying.

It was found that so long as one kind of starch and mode of preparation was considered, a concentrated paste was taken up in larger volume than one more dilute.

The amount of sizing picked up by the yarn was dependent primarily not on the concentration but on the viscosity of the size. A 36s Egyptian yarn was found in different experiments to carry the amounts of size shown in the following table:

No.	Starch	Concentration	Amount of Size (Paste) on Yarn	Apparent Viscosity	Dry Size on Yarn
190	Maize	4.2	67%	0.15	2.6%
192	Maize	6.1	134%	0.46	8.2%
195	Farina	5.2	178%	1.41	9.2%

The table shows that farina pastes are more freely taken up by yarn than are the maize sizes. This fact was attributed to the higher viscosity of farina compared with the maize pastes of equal concentration.

It was found that when the yarn was passed through the size and hung up to dry, the yarn was coated with a fairly uniform layer of starch completely encircling the yarn and there was little penetration. When the yarn was passed through the squeezing rollers, the major part of the size was squeezed from the yarn so that the coating on the surface was much lighter, but the squeezing action had forced the size into the yarn to some extent. Two stages of immersion and squeezing following each other in rapid succession had little more effect on the total amount of size taken up, but caused additional penetration.

Action of the Squeeze Roll

The fabric used to cover the top squeeze roll had an important influence on the sizing, a coarse flannel surface allowing the size to be taken up more freely, followed in order by a fine flannel, by a flannel covered with a cotton cloth and last by a coarse flannel covered with a cotton cloth. When the squeeze roll was loaded so as to double its pressure, the amount of size applied was reduced while the penetration increased, while three times the normal pressure had little more effect on sizing than twice, though the penetration was continuously increased.

The investigators concluded that the yarn entering the size box drags with it a covering of size which is more voluminous the higher the viscosity of the paste. On passing through the squeeze roller much of the paste is forced off the yarn, the amount displaced being less, and the sizing in consequence heavier, the more viscous the size, the softer the covering of the roller, the less the pressure, or the less the time available—as determined by the speed of the machine—for this flow to occur. Immediate repetition of the sizing and squeezing has no great effect on the quantity of the size in the yarn.

Penetration into the yarn is determined by physical conditions which control flow, being increased by heavy pressure, by repetition of squeezing or by prolonging pressure such as is experienced when the machine runs slowly.

They also conclude that presumably the viscosity of the size affects penetration, but it was not possible to obtain conclusive evidence on this point and that normally a sample of yarn from a dried warp bears little evidence of surface sizing.—Bulletin of the National Association of Cotton Manufacturers.

SILK MAKERS ACCEPT WASHING PRACTICE

A washing practice for use by the public on wash-fast dyed silks was agreed upon June 8 by the silk manufacturers, when a resolution was passed by the board of Managers of the Silk Association of America, Inc. At this, the regular quarterly meeting of the board, with H. Schniewind, Jr., presiding, the report of the committee which had been studying the question of washing dyed silks for some time was presented and accepted.

The washing practice for general use on wash-fast dyed silk fabrics gives the following directions:

"Prepare cool suds, using the pure neutral soap flakes recommended for washing fine fabrics. Use not more than one tablespoonful of flakes to a quart of water. If the water is hard or the garment excessively soiled, the amount of flakes used should be increased. Dissolve flakes in hot water, adding cold water until almost cool (90 deg. Fahr.). Wash by dipping garment up and down, squeezing suds through it rapidly; *never rub*. Squeeze out soap solution without twisting.

"Rinse three or more times in plenty of almost cool water. Roll tightly between towels, removing immediately. Shake a few minutes, then hang in shade. While still damp press on wrong side with moderate iron."

DUTCH BENZOL PRODUCTION INCREASING

Benzol is being produced in considerably larger quantities in the Netherlands than it was a few years ago, according to the Chemical Division of the Department of Commerce. Dutch production has been tripled since 1922 and is almost exclusively confined to one interest, the Staatsmijnen (Government coal mines) in Limburg at Heerlen, which is located in the southern part of the country along the German border The annual production of this firm amounts to 6,000 tons, which is almost entirely exported, as there is only small demand for their product in Holland.

NATIONAL RESEARCH COUNCIL CHEMICAL OFFICERS

The Division of Chemistry and Chemical Technology of the National Research Council has made the following elections which have been confirmed by the Executive Board of the National Research Council.

Chairman, Frank C. Whitmore; Vice-Chairman, George S. Hulett; Executive Committee, Frank C. Whitmore, chairman; George S. Hulett, vice-chairman; Roger Adams, William J. Hale, Charles A. Kraus, Charles M. A. Stine, Edward W. Washburn. Members at large for three years beginning July 1, 1927: William J. Hale, director of organic research, Dow Chemical Company, Midland, Mich.; Charles A. Kraus, research professor of chemistry, Brown University, Providence, Rhode Island. Representatives of Societies for three years beginning July 1, 1927—American Chemical Society: Roger Adams, professor of organic chemistry, University of Illinois, Urbana, Illinois; Harlan S. Miner, chief chemist, Welsbach Company, Gloucester City, New Jersey; Walter T. Taggart, Blanchard professor of chemistry, and director of the John Harrison Laboratory of Chemistry, University of Pennsylvania, Philadelphia, Pennsylvania; American Ceramic Society: Edward W. Washburn, chief chemist, U. S. Bureau of Standards; editor-in-chief, International Critical Tables, Washington, D. C. Liaison member from Division of Biology and Agriculture: William Mansfield Clark, professor of chemistry, and Chief, Division of Chemistry, U. S. Hygienic Laboratory, Washington, D. C.

FOREIGN DYE TRADE OF FRANCE

Imports of dyes into France are principally from Switzerland, Germany, and Great Britain, these three countries furnishing more than 90 per cent, according to a report from the Department of Commerce. From England are purchased only specialties, such as dyes for Celanese; from Germany are brought reparation dyes of kinds not made locally, or produced in sufficient quantity. The real competition experienced by local makers is, therefore, from Switzerland, but it covers nearly the entire range of dyestuffs. Despite the costs of production in Switzerland, the gold currency of that country and French import duties, Swiss makers have sold in competition with French-made dyes and at prices as low. It may be doubted, however, if these sales have always been profitable to the Swiss manufacturer. The improvement in French currency during the latter months of the year made the situation more favorable to Swiss exporters. A decision has, however, been reached among manufacturers in France and in Switzerland to avoid disastrous competition and an informal agreement made not to cut prices.

Favored by exchange, dye manufacturers have developed their export markets slightly, but there has been no large increase. In fact, the quantities shipped are nearly the same as those of 1924. Among the shipments the principal were azoic dyes, sulphur dyes, and derivatives of triphenylmethane.

In the pursuit of their policy of development, dye manufacturers were favored by a busy year up to its closing months. When the textile industries were suffering from the economic crisis which developed rapidly after the month of October, dyemakers could easily foresee a similar though less acute depression It did not in fact seriously affect them until the month of December when their business showed a reduction of about 25 per cent. In consequence, many of their employees, particularly foreigners, were dismissed

Harry White, overseer of finishing for the W. E. Tillotson Manufacturing Company, Pittsfield, Mass., has resigned his position with that company.

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

President
LOUIS A. OLNEY
Lowell Textile School, Lowell, Mass.

Vice-Presidents
E. H. KILLHEFFER—WALTER S. WILLIAMS

Secretary
WALTER E. HADLEY
5 Mountain Avenue, Maplewood, N. J.

Treasurer
WINTHROP C. DURFEE
516 Atlantic Avenue, Boston, Mass.

Councilors

RALPH F. CULVER — GEORGE A. MORAN
ARTHUR E. HIRST — HUGH CHRISTISON
WILLIAM R. MOORHOUSE — WALTER M. SCOTT

LOCAL SECTIONS AND THEIR OFFICERS

Northern New England Section—
Harold W. Leitch, Chairman, Franklin Mills, Franklin, N. H.
A. K. Johnson, Secretary, Lowell Textile School, Lowell, Mass.

Rhode Island Section—
John Hutton, Chairman, Glenlyon Print Works, Phillipsdale, R. I.
Albro N. Dana, Secretary, Franklin Process Co., Providence, R. I.

New York Section—
Herbert Grandage, Chairman, Clark Thread Co., Newark, N. J.
Daniel P. Knowland, Secretary, Geigy Co., 89 Barclay Street, New York City.

Philadelphia Section—
William Ralph MacIntyre, Chairman, Eddystone Print Works, Eddystone, Pa.
Percival Theel, Secretary, Philadelphia Textile School, Philadelphia, Pa.

Piedmont Section—
Charles S. Doggett, Chairman, Clemson College, S. C.
Dyer Moss, Secretary, Newport Chemical Works, Greenville, S. C

South-Central Section—
P. F. O'Neill, Chairman, Standard-Coosa-Thatcher Co., Chattanooga, Tenn.
J. Baynard Smith, Secretary, Chattanooga, Tenn.

Lowell Textile Junior Section—
Samuel Meeker, Chairman; Bernhardt Glickman, Secretary.

MAY MEETING OF THE NEW YORK SECTION

The regular annual meeting of the New York Section of the American Association of Textile Chemists and Colorists was held at the Elmwood Country Club, Paterson, N. J., on the evening of May 27. In the afternoon a number of the members availed themselves of the facilities of the club golf course. Dinner was served in the evening to about forty members and guests.

Election of officers for the season of 1927-28 followed the dinner. A nominating committee, consisting of P. J. Wood, chairman, Joseph F. Lange and Henry F. Hermann, proposed the following, who were duly elected with a unanimous vote of those present: Chairman, Samuel L. Hayes; vice-chairman, Dr. Oscar R. Flynn; treasurer, John J. Sokolinski; secretary, P. H. Stott; sectional committee: Louis Zisman, Morrell Morris, Dr. G. W. Knight, Arthur F. Wiehl.

In accordance with the amendment to Article VIII of the Constitution, P. J. Wood was elected to represent the New York Section on the nominating committee for officers of the parent body. On motion from the floor the chairman was empowered to appoint a committee to arrange the reception program of the annual meeting of the Association, which will be held this fall in New York City. A committee was also appointed, consisting of A. P. Howes, C. F. Schaumann and Daniel Knowland, to supervise the details of the annual outing of the New York Section, to be held this month.

After the conclusion of the business meeting the remainder of the evening was given over to entertainment furnished by the WEAF Neighborhood Trio.

P. H. STOTT, *Secretary.*

FORTY-FIFTH COUNCIL MEETING

The Forty-fifth Council Meeting of the American Association of Textile Chemists and Colorists was held at the Engineers' Club, Boston, Mass., Friday, April 29, 1927.

The following members were in attendance: L. A. Olney, W. M. Scott, E. H. Killheffer, George A. Moran, H. W. Leitch, H. Christison, W. E. Hadley, W. C. Durfee, B. Verity, W. A. Appel, William H. Cady, R. W. Hook and P. F. Ripley.

Letters of regret at not being able to attend were received from R. F. Culver, J. Hutton and R. E. Rose.

The following applicants were elected to membership:

Active Members

Baumann, Fred, dyer and chemist, Sussex Print Works, 25 Moran Street, Newton, N. J.

Beecher, Fred E., demonstrator and salesman, National Aniline & Chemical Company, 357 West Erie Street, Chicago, Ill.

Bogert, Prof. Marston T., professor organic chemistry, Columbia University, Havemeyer Hall, Columbia University, New York, N. Y.

Clark, O. W., fast color dyer, Bellman Brook Bleachery, Fairview, N. J.; 40 Harwood Terrace, Palisade Park, N. J.

Daley, Edmund C., textile printer and colorist, Ciba Company, Inc., 134 Cedar Street, New York, N. Y.

Davenport, H. G., sales manager, International Color & Chemical Company, Providence, R. I.; 353 West Eighty-fifth Street, New York, N. Y.

Gates, Walter S., general manager, Great Lakes Thread Company, 5133 Wesson Avenue, Detroit, Mich.

Guerin, Julien J., president and manager, Florence Dye Works, P. O. Box 195, Woonsocket, R. I.

Hyde, James, demonstrator and salesman, National Aniline & Chemical Company, 357 West Erie Street, Chicago, Ill.

MacIntyre, G. Gaynor, textile chemist. Lancaster Mills, 13 Haskell Avenue, Clinton, Mass.

McDowell, Benson, superintendent and dyer, Lewisburg Mills, Lewisburg, Pa.

Minikin, Leonard, chemist, Sussex Print Works, 180 Main Street, Newton, N. J.

Peinert, Emet A., assistant dyer, Lancaster Mills, 129 Haskell Avenue, Clinton, Mass.

Puckett, W. W., superintendent of dyeing, Southern Franklin Process Company, Greenville, S. C.

Scheren, Arthur L., foreman dyer, Miesch Manufacturing Company, 340 Totowa Road, Paterson, N.J.

Spuhler, William H., chemist, Ultra Chemical Works, 6 Smith Street, Paterson, N. J.

Stanton, Frederick W., colorist, Sussex Print Works, Newton, N. J.

Stuart, George, assistant chemist, Assabet Mills, American Woolen Company, 28 Nason Street, Maynard, Mass.

Junior Members

Choquette, Paul J., chemist, Pacific Mills, Lawrence, Mass.; 89 Butterfield Street, Lowell, Mass.

Fleming, Jr., J. T., student, Georgia School of Technology, Atlanta, Ga.; 691 Juniper Street, N. E.

Hamilton, Gilbert, assistant top dyer, Guerin Mills, Inc., Rosemont Mill, 182 Avenue C, Woonsocket, R. I.

Haynes, Amos K., student, Lowell Textile School, Lowell, Mass.; 9 Fifth Avenue, Haverhill, Mass.

Johnson, Earle E., laboratory assistant, Franklin Process Company, Providence, R. I.; 1249 Cranston Street, Cranston, R. I.

Johnson, T. R., chemist, Southern Franklin Process Company, Greenville, S. C.

Johnstone, Edwin P., student, Lowell Textile School, Lowell, Mass.; 298 Pawtucket Street, Lowell, Mass.

Lewis, Donald R., assistant chemist, Lowell Bleachery; 499 Wilder Street, Lowell, Mass.

McGibbon, James, student, Lowell Textile School, Lowell, Mass.; 5 Shirley Street, Lexington, Mass.

McLean, Earle R., student, Lowell Textile School, Lowell, Mass.; 25 Washington Street, Haverhill, Mass.

Phillips, William E., technical representative, Mathieson Alkali Works, 904 Commercial Bank Building, Charlotte, N. C.

Rodalvicz, Francis R., student, Lowell Textile School, Lowell, Mass.; 115 Mount Vernon Street, Lowell, Mass.

Rusticus, Theodore, hosiery dyer, National Silk Dyeing Company, 126 Carbon Street, Paterson, N. J.

Spedding, Fred, apprentice dyer, Wood Worsted Mills, 18 Pleasant Street, Lawrence, Mass.

Springer, Sidney, student, Bradford-Durfee Textile School, 15 Lindsey Street, Fall River, Mass.

Swenson, W. L., assistant general sales manager, General Dyestuff Corporation, 230 Fifth Avenue, New York, N. Y.

Turner, Mason M., colorist, Mallory Hat Company, Danbury, Conn.; 68 North Street.

Waller, Dan G., dyer, Chas. H. Bacon Company, Louden, Tenn.

The following Junior Members were transferred to Active Membership in the Association:

Harold D. Chase, 34 Palmer Street, Passaic Park, N. J.

Hector A. McCulloch, 36 Elro Street, South Manchester, Conn.

George W. Searell, 42 Ocean Street, New Bedford, Mass.

Nat. C. Shane, Jr., 24 Jane Street, Paterson, N. J.

The International Nickel Company, Inc., 67 Wall Street, New York, N. Y., was elected to Corporate membership; H. E. Searle was designated to act as representative in the affairs of the Association.

Research Work Discussed

Considerable discussion took place as to the type of man or men who should eventually be engaged to carry out the research problems which the Council has in mind. It was the general opinion that the man chosen must be of high caliber and capable of directing and advising in the problems undertaken. The question of where such a man could best conduct the work was discussed in considerable detail, and the Bureau of Standards was mentioned, as well as the laboratory of the Lowell Textile School. In case the work was done at the Bureau of Standards, it was pointed out that it would have to be approved by the Bureau and would be a publication of the Bureau, although it could be published in the Proceedings.

A motion was made rescinding the vote taken at the last meeting appropriating $750 for research work, and a further motion was carried appropriating $2,000 for a full-time worker at the Bureau of Standards under the auspices of the Association.

Progress was reported on the preparation of the data which are to be used in the endeavor to secure Corporate Members.

W. E. HADLEY, *Secretary.*

Members Elected at Forty-fourth Council Meeting

The following were elected to Active and Junior membership at the Forty-fourth Council Meeting, held Friday, March 14. Owing to lack of space these names could not be included in the report of that meeting.

Active Members

Baker, P. S., dyer, Hanes Hosiery Mills, 209 Winston Apartments, Winston-Salem, N. C.

Benedix, George W., overseer of dyeing, Kingsport Hosiery Mills, Homestead, Kingsport, Tenn.

Bohanan, W. H., dyer, Magnet Knitting Mills, Clinton, Tenn.

Davis, Oscar O., dyer, Samoset Cotton Mills, Talladega, Ala.

Diggle, William E., representative, John Campbell & Co., 408 Central Avenue, Charlotte, N. C.

Ephland, C. R., dyer, E. M. Holt Plaid Mills, Inc., Burlington, N. C.

Haddock, Paul F., Southern manager, A. Klipstein & Co., Charlotte, N. C.; Box 476, Myers Park, Charlotte, N. C.

Harris, Thomas R., demonstrator and salesman, Herrick Voight Chemical Corporation, 156 Pinehurst Avenue, New York, N. Y.

Ivey, W. R., demonstrator, Du Pont Company, Charlotte, N. C.; 232 West First Street, Charlotte, N. C.

Leuze, Dr. A., plant chemist, U. S. Finishing Company, 160 Broad Street, Providence, R. I.

Levitt, Benjamin, chemist, C. W. Young Soap Company, 1247 North Twenty-sixth Street, Philadelphia, Pa.

Maher, Charles E., superintendent of dyeing, The Everwear Hosiery Company, 382 Tenth Street, Milwaukee, Wis.

Marlowe, Thomas A., sales agent, L. Sonneborne & Sons Company, P. O. Box 322, Charlotte, N. C.

Maurer, Alex., research chemist, Lyons Piece Dye Works, 568 East Twenty-sixth Street, Paterson, N. J.

Metz, Herman A., president, General Dyestuff Corporation, 122 Hudson Street, New York, N. Y.

Norman, Roy C., dyer, Rhode Island Plush Mills, 90 Meadow Road, Woonsocket, R. I.

Post, C. Irving, demonstrator, National Oil Products Company, 204 Johnson Building, Charlotte, N. C.

Proctor, Ed. E., chief chemist, Providence Dry Salters Company, 22 Pierce Street, East Greenwich, R. I.

Randolph, A. L., assistant Southern manager, Du Pont Company, 232 West First Street, Charlotte, N. C.

Rose, Harry, chemist, Cotton Research Company, Inc., 1020 Washington Street, Boston, Mass.

Sandler, Martin, chemist, Clifton Yarn Mills, Inc., 739 South Second Street, Philadelphia, Pa.

Schaetzel, Andrew P., chemist, Whiting Piece Dye Works, Haledon, N. J.; 403 Central Avenue, Hawthorne, N. J.

Schmidt, Ernest H., dyer, E. P. Maupai Dyeing Company, Inc., West New York, N. J.; 26 Cembermede Road, Palisade, N. J.

Stigen, B. A., Southern manager, General Dyestuff Corporation, 220 West First Street, Charlotte, N. C.

Stonely, Frederick L., bleacher, New England Lace Mills, 114 Sheffield Avenue, Pawtucket, R. I.

Watkins, Willard H., dyestuffs chemist, Calco Chemical Company, 216 Mountain Avenue, Bound Brook, N. J.

White, James I., demonstrator and salesman, National Aniline & Chemical Company, 206 West Sixth Street, Charlotte, N. C.

Junior Members

Barnard, Kenneth H., chemist, Pacific Mills, Lawrence Y. M. C. A., Lawrence, Mass.

Buddy, Gridley, textile chemist, S. Slater & Sons Company, 2 Nelson Street, Webster, Mass.

Curry, Walter F., assistant colorist, The Apponaug Company, P. O. Box 466, Apponaug, R. I.

Fusser, Ludwig, textile colorist, General Dyestuff Corporation, New York, N. Y.; 628 Second Street, Brooklyn, N. Y.

Lannaghan, Thomas J., assistant chemist, Bellman Brook Bleachery, Fairview, N. J.; 634 Monroe Place, West New York, N. J.

Remick, Lawrence E., laboratory assistant, Lever Bros., Cambridge, Mass. 16 Clark Street, Braintree, Mass.

Spurr, Albert H., overseer of dyeing, Ipswich Mills, 31 County Street, Ipswich, Mass.

Thomas, Ernest William, student, Bradford Durfee Textile School, Fall River, Mass.; 13 Chestnut Street, Taunton, Mass.

Withers, Robert S., laboratory assistant, Chas. E. Mullin, Camden, N. J.; 314 Church Street, Merchantville, N. J.

Applicants for Membership

Active Membership

Cullen, Matthew A., colorist, National Aniline & Chemicaal Company, Buffalo, N. Y. Sponsors: T. F. Murphy and C. E. O'Connell.

Ekroth, Clarence V., consulting chemist, Ekroth Laboratories, Inc., New York, N. Y. Sponsors: F. M. Bennett and H. J. Stulz.

Fischer, Harry, colorist, National Aniline & Chemical Company, Buffalo, N. Y. Sponsors: T. F. Murphy and C. E. O'Connell.

Harkness, Arthur F., chemist, Lewis Manufacturing Company, Walpole, Mass. Sponsors: R. W. Hook and W. J. Murray.

Heintz, Wallace P., salesman demonstrator, E. I. du Pont de Nemours & Co., Boston, Mass. Sponsors: H. E. Gile and George K. Hannah, Jr.

Jones, Jr., Andrew, dyer, National Aniline & Chemical Company, Buffalo, N. Y. Sponsors: T. F. Murphy and C. E. O'Connell.

McCarty, A. B., manager, American Aniline & Extract Company, Philadelphia, Pa. Sponsors: W. S. McNab and J. B. Smith.

McCarty, George S., salesman and demonstrator, American Aniline & Extract Company, Philadelphia, Pa. Sponsors: W. S. McNab and J. B. Smith.

Changes of Address

Hirsch, L. S., 271 Madison Avenue, New York City, N. Y.

Sturtevant, H. B., 398 Morse Avenue, Ridgefield, N. J.

Watkins, Willard H., 216 Mountain Avenue, Bound Brook, N. J.

Resignation

Fuhr, Adolph, 123 New Holland Avenue, Shillington, Va.

ASSOCIATION BADGES

The lapel button badge illustrated herewith is worn by members of the American Association of Textile Chemists and Colorists.

The three "rings" are enameled in red, yellow and blue, respectively, and the initials and border are brought out in gold. The general effect is exceedingly attractive.

Badges may be secured at $1.50 each by addressing the Secretary.

WALTER E. HADLEY,
5 Mountain Avenue,
Maplewood, N. J.

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
PROFESSOR OF CHEMISTRY AND DYEING, LOWELL TEXTILE SCHOOL
Directing Editor

CLAYTON HOAGLAND
Managing Editor

MYRON DREW REESER
Advertising Manager

Published biweekly by
HOWES PUBLISHING CO., INC.
90 William Street, New York City

A. P. HOWES, *President* E. S. PREDMORE, *Secretary*

Subscription price $5.00 per year; Canadian $5.50; foreign $6.00

Vol. XVI June 13, 1927 No. 10

WHAT MAKES THE MASTER DYER?

WHEN our ancestors crudely dyed their homespuns with Indigo there were some even then who called dyeing an art. Perhaps it was, but what are we to call the kind of dyeing that we do to-day? It is more than a craft, more than an art, and even to call it a science is to slight that personal skill which marks off the expert from the unpractised, book-learned worker. Dyeing has become a combination of craftsmanship and science, and a man must look at his work from both angles if he would be called a master dyer.

Within the ranks of those who have learned both the craft and the science of dyeing, two broad classes may now be distinguished: the specialist and the versatile dyer. Each has earned a secure place in his trade; the small mill making one or two lines needs the specialist for its high-class work, while the large mill always has a kindly eye for the future of the man who has sedulously trained himself to dye many kinds of fabrics and meet many different conditions. Both types of dyer are assured of steady employment so long as they recognize the importance of technical training as an adjunct to their experience—so long as they realize that while they may learn their craft in the mill, they must go to a more authoritative source for their science.

For who shall say that even the specialty dyer of long experience needs no theory to balance his practical knowledge? The processing of any class of fabrics that might be named has become so complex as to require training beyond that which may be learned in the old school of hard knocks. This is a day of styles and modes that have a popularity as short-lived as a rocket's flare. Novelties have broken up the even flow of the most staple goods, and, combining new synthetic fibers with the old, draw on every known device of the modern dyer's art for their production. Where is the dyer who knows what class of work he may be called upon to do to-morrow?

Rayon, once regarded as cotton's rival, according to a current review of textiles, is now used more extensively by cotton mills than by any other branch of the industry. New and constantly varied combinations of different rayons with cotton, wool and silk have multiplied the dyer's problems—much faster than he has kept step with them. This situation has cut out a special niche that can be filled only by the man who is able to produce perfect results under these rapidly shifting conditions; who knows the properties of dyes and the structure of fibers and the freakish things they do in combination; who can therefore meet the most exacting requirements and solve the knottiest problems with the least experimenting and the lowest operating cost. Such versatility comes not easily, even to the most experienced, and nearly always underlying it is a superb confidence in one's ability, based on a sound technical education.

To-day the technically trained man can quickly develop into a more reliable dyer than one who must depend entirely on his practical experience. One can, true enough, pick up innumerable scraps of information by changing from mill to mill and listening to one's superiors, but this is not education. There is something about such patchwork knowledge—it does not hang together and is often vague—that keeps its possessor in the rut, simply because he lacks that confidence which leads the trained man on to high planes of endeavor. The old-fashioned knock-about type of practical dyer may know how certain troubles are caused in processing, but he seldom knows the true *why* of it. Like the homoepathic doctor he may have his own special remedies, gathered while he rolled about seeking experience, but these have become pretty unreliable, if not obsolete, in this age of new colors, new fibers, and new methods.

The dyer who understands the chemical theories of his processes, on the other hand, has learned certain basic laws of chemical science that apply under almost any condition. Because such a man is always several jumps ahead of mere skill, he has quickly found a permanent place in the modern mill, and though he may modestly specialize or profess an all-round ability as textile chemist and dyer, he stands to-day among the masters of this ancient art that has become both craft and science rolled in one.

THE FUTURE OF FUR DYEING

THE only relation apparent to the layman between the fur trade and the textile industry lies in the identical use of their products for apparel. But there is a distinct technical relation between the processing of textiles and the processing of furs that is clearly explained by William E. Austin in his article in this issue, when he declares that fur dyeing is essentially a chemical industry. Textile chemists can easily understand how the fur dyer's art has been directly aided and advanced by developments in the dyeing of fabrics. As Austin states it, the one has borrowed ideas from the other.

Yet the fact that such a relation between furs and

fabrics does exist, not merely in theory but in practice, takes nothing away from the novel character of that relation. Basically alike in structure though furs and some textile fibers may be, yet in their manufactured state they differ widely in form. Furs retain much more of their natural quality, even when made to imitate each other. They are not spun, woven or knitted, nor must they undergo so many complex mechanical treatments as textiles before they are ready to wear. It is solely because, like textiles, chemicals are necessary for their preparation, from the first dressing to the final topping, that so many of the fur dyer's problems are identical to those that worry the textile dyer.

The origin of many of the mill dyer's worst troubles can often be traced back to one of the many processes through which fabrics pass *before* reaching the dyehouse. Similarly the fur dyer is not always to blame for his failures. When he receives his pelts they usually have been dressed and are supposed to be ready for dyeing; but often the dressing process has not been done with the proper chemicals, and the fur has hardened and must be further treated before dyestuff can be applied. If the cleaning of a fur has not been thorough, owing to some defect in the chemical treatment, that also will cause trouble for the dyer.

Most of the difficulties that make of fur dyeing such a complicated process would disappear if only more were known about the chemistry of the treatments that precede dyeing, such as the dressing, the cleaning and the bleaching. These must be studied more thoroughly by textile chemists if further advances are to be made in the art of fur dyeing. Even the dyeing itself has undeveloped possibilities. Rapid style changes and the increasing popularity of furs for apparel will eventually make more extensive chemical research on this subject imperative.

GERMAN DYE TRUST REPORTS LARGE PROFITS

Nothing illustrates the high efficiency of a well-organized trust better than the net profits reaped by the German dye cartel, which are reported to have exceeded $15,000,000 in 1926. The stockholders of this huge consolidation will shortly receive a 10 per cent dividend, which was proposed at its ordinary general meeting, held June 2.

The annual report of the I. G. Farbenindustrie has just been published, according to Trade Commissioner William T. Daugherty, and reveals that net profits in 1926 totaled 68,718,000 gold marks, without balance carried forward, but at 70,524,000 marks, including the latter item. Comparative figures for 1925 are 67,598,000 and 69,044,000 marks. In 1924 there was a net profit of 54,690,000 marks without balance forward. (The reichsmark is currently quoted at about $.236.)

Gross profits increased from 168,565,000 marks in 1925 to 186,075,000 in 1926. General operating costs declined from 45,197,000 marks to 42,119,000, indicating the progress of the fusion into a "super-trust" approved by stockholders on November 28, 1925, when the then six leading members of the German Dye Trust pooled their resources into one company, began to reallocate production, and to reduce overhead by better economy operation and distribution. Amortizations are written up at 75,237,000 marks against 55,770,000 in 1925.

Despite increasing competition on the world's markets, sales of dyestuffs by the company improved at home and abroad, particularly, as a result of the consolidation of plural foreign sales agencies but also reflecting the more favorable economic situation according to the annual report which states further that, so far as can be gauged at present, the improvement will continue during 1927.

EFFECT OF I. G. FUSION UPON CONSUMERS

Considering the effect of the I. G. Fusion upon the German consumers of their products it can be stated that no benefit has resulted. In fact, with reference to prices the consumers are at a disadvantage owing to an over increase of German as compared to world market prices. For this reason certain dyers have started to produce in their own plants a part of their dyes from imported intermediates, says a report from Consul H. C. Claiborne, Frankfort on the Main. The values of imported dyes from Switzerland have shown a steady increase. German imports of coal tar dyes have reached an unprecedented height; in 1926 imports were 3,600 tons valued at 17,364,000 marks (mark equals $0.2370). In pre-war times Germany exported 85 per cent of production, to-day 66 2-3 per cent are exported from a production of 56,000 tons, compared to 129,000 tons pre-war production.

WILLIAM M. MORRIS

William M. Morris, treasurer of the Hussong Dyeing Machine Company, of Groveville, N. J., died on May 27 after a protracted illness. He was sixty-six years old.

Mr. Morris was long and actively identified with the dyeing machinery industry and was treasurer of Morris & Co., and the National Tube Cleaner Company, also of Groveville, in addition to his important connection with the Hussong Company. He had associated himself with his father's interests at the Groveville plants shortly after his graduation from college. For a number of years and until his death he was president of the First National Bank of Bordentown, N. J.

P. H. Stott, of Newport Chemical Works, newly elected secretary of the New York Section of the American Association of Textile Chemists and Colorists, sailed for Europe on June 1 from Montreal, Canada. He will visit relations in England, tour the British Isles and return during the early part of August.

LOWELL TEXTILE HOLDS TWENTY-NINTH COMMENCEMENT

Southwick Hall of Lowell Textile School, Lowell, Mass., was all astir on Tuesday morning, June 7, for many proud parents and relatives had gathered there to see twenty-nine students receive degrees in textile manufacturing. Almost half of this number, or fourteen, were presented with the degrees of bachelor of textile chemistry and bachelor of textile engineering.

The address of welcome was, as usual, delivered by Charles H. Eames, president of the textile school, who also made the presentation of medals and other awards to honor students. The principal speaker on the day's program was State Deputy Commissioner of Education Frank W. Wright.

"Custom and usage classify law, medicine, theology, science as professions, and within recent years business has been added," declared President Eames in his interesting address. "The interrelationship of the many fields of business has resulted in development of conditions as complicated, puzzling and baffling as any problem of science. The so-called scientific approach to business has helped simplify these conditions."

President Eames further emphasized the part which this scientific approach to modern problems of manufacturing is playing in the textile industry and the consequent importance of technical education in fostering the proper attitude.

The subject of the inspiring talk delivered to the graduates by Frank W. Wright was "The Three C's," which he defined and discussed at length as Culture, Character, and Citizenship.

Awards and prizes were presented to the graduates and other class men as follows:

Medal of the National Association of Cotton Manufacturers, presented by Dexter Stevens, 1904, awarded to Richard Morey Sawyer, of Winchester.

Edward A. Bigelow prize, $100 to the member of the graduating class in the wool manufacturing course who maintains the highest standing throughout his three years, awarded to Edwin Thomas Hanscom, Sanford, Me.

Edward A. Bigelow prize, $50 to the member of the second-year class in the wool manufacturing course who maintains the highest standing during the first two years, awarded to Walter Urban Gaudet, Pawtucket, R. I.

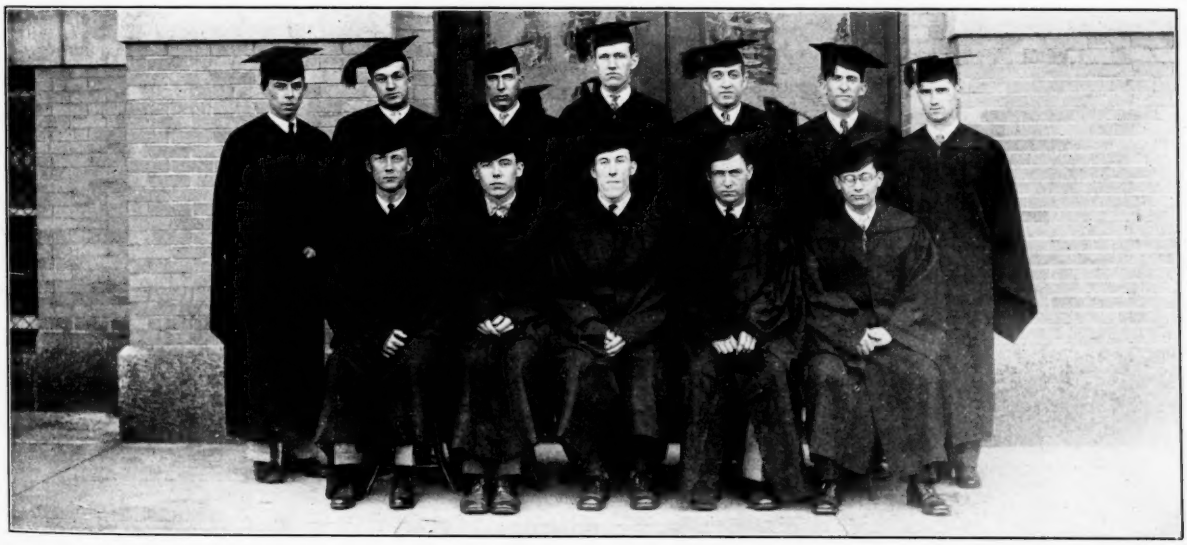
Edward A. Bigelow prize, $25 to the member of the first-year class in the wool manufacturing course who maintains the highest standing during his first year, awarded to Joseph Johnson Brook, Simcoe, Ont.

Textile colorist award, a prize of $100 offered by the Textile Colorist, Inc., to a member of the graduating class whose thesis, based upon his personal researches and experiences, is of the greatest practical value to the dyeing, bleaching or textile finishing industries, awarded to Samuel Meeker, Lowell, and Thomas Joseph Tarpey, Somerville.

Scholarship of the Proprietors of Locks and Canals on the Merrimack River offered at M. I. T., awarded to Richard Morey Sawyer, Winchester.

Louis A. Olney book prizes (in the forms of books), $20 to the regular student in the chemistry and textile coloring course who shall present the best thesis preparatory to graduation, awarded to William Francis Brosnan, Lowell.

Ten dollars and five dollars to the students taking the regular chemistry and textile coloring course who shall be considered as having attained the highest and second highest scholarship in second and first year chemistry, respectively: First year, first prize, Arthur



GROUP OF GRADUATES OF THE TEXTILE CHEMISTRY CLASS, LOWELL TEXTILE SCHOOL
Front row (left to right): Samuel Meeker, Thomas J. Tarpey, William F. Brosnan, Thomas H. Flood, Bernhardt Glickman.
Second row: Richard M. Sawyer, Lawrence W. Guild, Robert W. Parkin, Charles S. Parsons, Louis Goldenberg, Jerome Franks, John Leslie Merrill.

Francis Gallagher, Lowell; second prize, Bliss Morris Jones, Lexington; honorable mention, Bernard Levingstone, Woodstock, Vt.; Morris Barsky, Brooklyn, N. Y. Second year, first prize, Earle Raymond McLean, Haverhill; second prize, Alvin Wilfred Bergeron, Haverhill; honorable mention, Almos Kempton Haynes, Haverhill.

Herbert A. Currier scholarship—$100 given by Herbert A. Currier, of the class of 1906, to a student selected by the faculty of the school, the following conditions to be considered in making the selection: Scholastic standing, financial need and ability in promoting student activities in school life. Awarded to James Francis Corbett, Lowell.

The roster of those making up the classes in textile chemistry and textile engineering, with the titles of their theses, follows:

BACHELOR OF TEXTILE CHEMISTRY

William Francis Brosnan, Lowell. "A Study of the Effects Upon the Fiber of the Alkaline Reagents Used in Viscose Processing."

Thomas Henry Flood, Lowell. "The Effect of High Temperature and Pressure on Dyeing."

Bernhardt Brecher Glickman, Dorchester. "The Immunization of Cotton."

Clarence Hooper, Shirley. "A Study of the Products Formed by the Coupling of Diazotized Aromatic Amines to the Flourescein Configuration." (Thesis with Chester W. Meyers.)

Samuel Meeker, Lowell. "A Study of Certain Amino Derivatives of Acridine and Some Related Compounds."

Chester William Meyers, Billerica. (Thesis with Clarence Hooper.)

Thomas Joseph Tarpey, Somerville. "New Dyes Derived from Acenaphthene."

BACHELOR OF TEXTILE ENGINEERING

Jerome Franks, Brooklyn, N. Y. "An Investigation to Determine the Effect of Age Upon the Strength of a Cotton Yarn." (Thesis with Charles S. Parsons.)

Louis Goldenberg, Boston. "Development of a Device to Measure the Tension in a Yarn During Spinning."

Lawrence Winfield Guild, Quincy. "An investigation to Determine the Possibility of Using an Illuminometer to Distinguish Between Finishes on a Cotton Cloth." (Thesis with Kenneth L. Woodbury.)

John Leslie Merrill, Lowell. "A Determination of the Relation Between Yarn Strength and Fabric Strength."

Robert Wilson Parkin, Maynard. "A Study of the Relation Between Various Characteristics of Commercial Knit Underwear Fabrics."

Charles Sumner Parsons, East Milton. (Thesis with Jerome Franks.)

Richard Morey Sawyer, Winchester. "A Study of the Effect of Changing the Speed of the Cylinder on a Card, Keeping the Other Parts at a Constant Speed, on the Strength and Elongation of the Yarn."

The Dyer's School of Experience

[EDITOR'S NOTE.—*The following narrative is one of a series being published under the general head of "The Dyer's School of Experience." Realizing that the genuine material for such a series is to be found largely among its own readers, The* REPORTER *solicits contributions from that source and will pay for those accepted at regular space rates. Among the readers of this journal there should be many who have, in the course of their experience as dyers or chemists, encountered incidents which should prove most interesting and helpful to their fellows. Send all manuscripts to* AMERICAN DYESTUFF REPORTER, *90 William Street, New York City.*]

ADDING TO PROFITS IN A SILK THREAD MILL

By NOEL D. WHITE

Davenport Hosiery Mills, Chattanooga, Tenn.

WHEN I arrived in Montreal, Canada, I was astonished to see such a large city, as I had thought I was going into the wilderness; and the snow that greeted my arrival the first week in January was something I shall never forget. About eight feet of snow was piled up in the middle of the street from clearing the sidewalks, so that anyone standing on one side of the street could see only the housetops on the opposite side.

I inquired my way to the silk mill and in a short time found myself in the presence of a young man who introduced himself as the manager of the mill with which I was to cast my lot, for better or for worse, for the next five years. He gave me in a few words the history of the concern, which was composed of himself as secretary and manager, another gentleman as president and sales manager, and one silent partner living in New York, sharing in the profits and balancing the control of the business. He told me all this to make it plain to me that the firm was small, had just started a few months previous, but had good prospects in a growing country and a steadily growing clientele extending from Halifax, N. S., to Vancouver, B. C.

TAILOR'S THREAD

They were making three-ply machine-twist buttonhole silk and hand-sewing silk thread for tailors, dressmakers and the shoe trade. About fifteen shades for the tailor trade were to be Sumac work. I asked the reason for using Sumac, since the labels on the boxes they packed the silk in called for pure silk thread, and was told it was to make the thread fast to light. That silk could be

weighted to a large extent with Sumac he had not the slightest idea.

The man who was managing the mill had been a bookkeeper in a large mill in Massachusetts where they made silk thread the same as they were doing here, and had started this mill together with a foreman from the same place he came from, and knew the manufacturing part as far as winding, doubling and twisting. I saw that I had to educate him in the possibilities of processing silk in the dyehouse. And he was eager to learn, which made it easier.

They also had sample cards containing forty-eight shades for the dressmaker's trade and to sell to department stores. They had bought the silk already dyed, selecting the shades they wanted to start with, and made their sample cards. The tailor shades were put on spools holding one ounce of silk each and were sold sixteen spools, or one pound, to the box, the threads running from OO, O and A, the finest size, to F, the coarser thread. For each letter there was a corresponding number of yards on the spool, from some 800 yards for the coarser thread to 1,200 yards for the finest.

The buttonhole silk for the tailors was lightly braided in six threads together and sold on spools of from two to four ounces. The idea was that the tailor could cut the length needed for a buttonhole and he would thus have enough ready-cut silk for six buttonholes. The forty-eight shades were dyed on the A thread only and the D for buttonholes, except on some special orders which were not kept in stock. It was put on spools of fifty and one hundred yards, and ten yards for the D.

One morning, about six months after I got there—we were contemplating moving to larger quarters, having outgrown our present location—I went to the mill to find that during the night they had had a fire on the floor above that occupied by us and the water, coming through our ceiling, had nearly ruined all our stock—machinery, silk and all. That hastened our moving. With the insurance money they fitted up a larger and better place. My first job was to build a new and bigger sample card, for which I dyed the silk in 108 shades and some twenty-five Sumac-dyed colors. At this time I thought I would start to show my boss something that could be done to increase the profits. As I knew him to be a religious man, I thought best to say nothing at first for fear he would have scruples about it. Then something happened that made me feel I had to come to the rescue.

A Drop in Silk Prices, and Its Results

They were buying Japan silk as they needed it, paying the current prices. In those days Japan silk in the gray had been bought as low as $3.20 a pound. It had gradually increased in price, until at that time it was $6.20. The boss needed some silk badly; had waited until he could wait no longer for the price to come down. Finally he wrote an order for ten bales at $6.20. The next morning a telegram came stating that he should have wired for the silk at that price; that during the night the price had gone up 50 cents, and they would ship the silk at $6.70, providing he wired at once. As there was nothing else he could do, the boss sent the order by wire and in time we got the silk.

But after we received the first two bales the price began to come down and kept coming down. The boss started to swear, and declared that he would cancel the order and buy silk somewhere else. That brought the agent to Montreal, and after a long parley it was decided that we would get the silk as ordered at $6.20 to be delivered at intervals, and in the meantime we could buy as needed at the cheaper price. That extended the loss over a longer period and it helped some—and then I decided to act.

In dyeing with Sumac I first used to dye the silk in a broken soap bath. When the shade was near to sample and a little clearer, the procedure was to add to the bath a small dipper of Sumac extract and finish the dyeing to a good match, then to take the lot out, wash it, give it a cold soap, and finish with a little acid. My new process was to dye the silk first lighter than the sample in a broken soap, then in a clear bath strong with 10 per cent tannic acid I would finish the matching and let the lot stand in the cooling bath for about two hours and finish as before. The silk, on cooling, would take up most of the tannic acid and bring the weight of the silk to about fifteen ounces to the pound, which ordinarily would have been about thirteen. I kept my old tannic acid baths for further use, for I had a large place to do my dyeing now and all I needed were a few empty kegs, for my lots were about ten pounds each.

The first time I did it I watched for symptoms on the face of my employer. He said nothing about it, but asked me if I was sure I had dried the silk thoroughly, and told me if the silk was damp on the spool it would cake and shrink in a mass and look bad on the spool, especially if left for some time without using it. I said I had delivered it bone-dry. Next I thought I would increase the weight on the black somewhat and see how he liked it.

A Weighting Experiment That Worked

I was using nitrate of iron at about 10 deg. Tw., one pass; then in a saddening bath with Fustic Extract and Hematine, and in a soap bath with Hematine would finish my dyeing. I made the iron bath to stand at 25 deg. Tw., and in the saddening bath I used for my first 100-pound lot 25 pounds of Gambier and let the lot lay in the bath all night. In the morning I washed it, dyed it in the soap and Hematine, and finished it as usual. This time the boss came to me and said: "I must have made a mistake in sending you that last lot of black." I asked him why. He explained to me that he had an attachment on his spooling machine which measured the yards going on the ounce spools, and found that on the spool calling for 1,000 yards he could only put on about 900 yards.

"Could you use that for a higher letter instead?" I

asked him. "Of course, I have to do that, but I can't understand how I made a mistake."

"Maybe you did not make a mistake," I volunteered. "Don't you know that in dyeing, especially on black, it is very easy to load the silk to any desired weight and hardly be detected except by experts?"

"Did you do that yourself?" he asked. This was the crucial moment. I could not know yet whether he was pleased or whether he would call me down for doing a thing he thought dishonest.

I said: "You know that in boiling off silk loses about 25 per cent of its weight. Now, I thought maybe you would like to get back at least part of the weight you lose. If you think it is not right I will not have to do it any more, but I can assure you that it is done almost everywhere."

"Why," he said, "I have heard of the practice of loading silk, but I always thought it was a very complicated affair that could only be done in large and well-equipped dyehouses."

"Of course, it takes a practical silk dyer to do it properly. You saw the results I obtained. I have done it on Sumac work, and you did not understand what had happened, and now on black it has mystified you. If I had not told you, you could not have detected any difference. How do you expect a tailor to see that your silk is loaded providing it is not done to extremes, thereby weakening the thread? We have now quite a nice trade among the tailors; why not try it for a while? It is a safe bet that your competitor, if he has a real silk dyer, does the same thing. If at any time there should be any complaints we can easily stop, and I do not need any extra equipment anyway."

"All right," he replied. "You go ahead and give me fourteen ounces on the finer counts OO, O and A. On B, C and D you try to give me sixteen ounces, and on buttonhole silk and E and F go as far as you can safely."

An agent for a dyestuff dealer had procured for me the twenty-five pounds of Gambier to do my first batch. I now gave him an order for a bale and proceeded to do my dyeing as directed. At the end of the month we were going with the wind, not a complaint had come in, and I started to figure out the gain with my new processing. It amounted to about $200 a week.

I went to the boss one morning, figures in hand, and told him I believed the trick had worked as good as I expected. I must mention that at this time he had secured a big contract with a manufacturer of fine shoes who was using silk for his uppers. Through our heavy loading with Sumac and Gambier he was enabled to meet his bigger competitors' prices and was elated over the new account. He said he was surely glad I had shown him the way.

"Is that worth a raise for me?"

"Surest thing you know. But why didn't you do that in the beginning?"

I thought about his religious scruples, but I said: "You told me you wanted pure dye silk."

Reports of the Progress of Applied Chemistry. Issued by the Society of Chemical Industry. Volume X; 1925. 701 pages. $6.00. D. Van Nostrand Company.

Contains interesting surveys of progress in the fields of dyestuff manufacture; fibers, textiles, cellulose and paper; bleaching, dyeing, printing and finishing. Though not up to date, extremely valuable as a reference work, since it covers every field of applied chemistry.

Colloid Symposium Monograph. Edited by Harry Boyer Weiser. 378 pages. $6.50. D. Van Nostrand Company.

Papers presented at the fourth national symposium on colloid chemistry at the Massachusetts Institute of Technology, June, 1926.

Soaps

The Modern Soap and Detergent Industry, Including Glycerol Manufacture. By Martin Goeffrey. In three volumes. Volume III: The Manufacture of Glycerol. Illustrated. $12.00. D. Van Nostrand Company.

This volume on glycerol manufacture completes the work on the soap and detergent industry, which in its entirety comprises a complete practical treatise on the manufacture of laundry, toilet, pharmaceutical, textile, abrasive, scouring and powdered soaps; also detergent compositions and substances of all kinds.

Story of Standardization

Standards Yearbook—1927. Prepared by the National Bureau of Standards, Department of Commerce. 398 pages. $1.00.

At last we have a comprehensive record, bound for permanent reference, of the world-wide movement for the standardization of industrial products. The record is presented by one of the largest, most active and most important standardizing agencies in the world, the Bureau of Standards at Washington.

Why is the standardization movement now considered as one of the most revolutionary advances ever made in science as well as in industry? Because, as this book says in its opening sentences, "The trend [of standardization] is away from mere opinion, or even expert judgment, and toward verifiable determinations by research of those quantities or properties which assure maximum utility." To express it differently, standardization has been lifted out of the realm of "efficiency fads" and placed high among the functions of modern industrial science, be-

cause its findings are reached by *laboratory methods* rather than by empirical judgment.

The Standards Yearbook represents an effort to present an adequate picture of the diversification and ramification of the standardization movement which has spread throughout the world with astonishing vitality during the twenty-five years that have elapsed since the establishment of the National Bureau of Standards. It contains outlines of the activities and accomplishments not only of this bureau and other agencies of the Federal Government and the States and municipalities, but also of the American societies and associations of which standardization is a major or very important activity. Descriptions and illustrations are presented of all the fundamental national standards of the United States. Moreover, outlines are given of the various foreign national and the several international standardizing agencies.

In a general review of the standardization movement in America attention is directed to the remarkable growth in the activities of trade associations, the development of "mass-production," method of factory production, and to the vital interest now being shown in standardization by industrial executives. Noteworthy in the trend of the development of standards is the process based on the elimination of excess varieties and sizes which is supplementary to the slower process involving technical consideration.

In the chapter that outlines some of the activities and accomplishments of the Bureau of Standards there are interesting sections covering the bureau's work in chemistry and in the testing of organic and fibrous materials, under which come its investigations on dyes and textiles.

The research work on chemical products includes important investigations of the detergent value of soap, of the absorption spectra of dyes, and of the fastness of dyed fabrics, the latter study being that in which the American Association of Textile Chemists and Colorists is co-operating. The bureau's valuable studies on textile materials, as outlined in the volume, comprise research on the heat-retaining properties of laundered cotton blankets; rayon properties; effects of dry cleaning on silk (some results of which have been published in the REPORTER); development of cleaning processes; cleaning of furs and leathers; and moisture content of cotton yarns.

In a chapter on the standardizing activities of technical societies and associations the work of the American Association of Textile Chemists and Colorists is concisely outlined, with a note on its proposed co-operation with European textile research bodies.

An Outline of Chemical Research

A Survey of American Chemistry, Vol. I—July, 1925, to July, 1926. Edited by William J. Hale in co-operation with Clarence J. West. 257 pages. The Chemical Catalog Company. $2.00.

From its eminence the National Research Council surveys the complex research activities in every branch of modern science. Through its Division of Chemistry and Chemical Technology it presents this valuable outline, or rather symposium, on the research that is marking off the steps of progress in chemistry to-day.

Through the pages of this book a student of chemical research may approach the subject with a thoroughly modern viewpoint, for the period covered by its chapters is only a few months old. We are given a panoramic view, somewhat technical and sketchy, it is true, but highly informative, of thirty-three major branches of chemical research, from acids and aluminum through dyes, proteins and rubber to water and zinc.

Besides the editors, who have ably supervised the entire work, there are thirty-two contributors, each prominent in the field he has chosen to discuss. Each chapter concisely reviews the most recent work accomplished in the special division of chemistry under survey, and in some cases draws interesting conclusions as to the trend which research in that subject should follow in the near future.

Nearly half of the text concerns research undertaken in what is broadly defined as organic chemistry. There is a chapter on azo dyes and intermediates by Ernest F. Hitch, of E. I. du Pont de Nemours & Co. laboratories, and another on vat dyes by Elmer K. Bolten, also of the Du Pont company. Some textile chemists may be guided to sources of useful data by the chapters on proteins and cellulose, and will undoubtedly find interesting the complete review of colloid chemistry. The editor, William J. Hale, contributes a thought-provoking paper on "Co-operative Research Between Industries and Universities."

Throughout all of the chapters numerous references to patents and other technical literature are listed, so that the little volume almost constitutes an up-to-date bibliography on modern chemical research.

BRITISH PRODUCTION OF COKE AND BY-PRODUCTS

According to the third census of production, 1924, there was a striking increase in coke oven by-products, due not so much to the greater quantity of coal carbonized, as to greater efficiency in the process. In 1907 the value of by-products was 7 per cent of the gross output; in 1912 it was 18 per cent, and in 1924, 31 per cent. The following production figures of coke oven by-products are from the third census of 1924. Coke,, 12,803,000 tons; tar, 500,000 tons; sulphate ammonia, 185,000 tons; anthracene, 66,000 hundredweight; benzol, 37,900,000 gallons; carbolic acid, 28,000 hundredweight; naphtha, 1,812,000 gallons; naphthalene, 191,000 hundredweight; pitch, 151,000 tons; tar oil, creosote oil, and other heavy oils, 17,132,000 gallons; tar oils, 1,669,000 hundredweight; toluol, 320,000 gallons. The total value of the by-products, including waste heat sold, other distillation products, etc., £24,389,000.

Technical Notes from Foreign Sources

Reserve Dyeings with Vat Colors Under Indanthrene Dyeings

It is known that the salts of zinc and of manganese act as resists in the dyeing with Indanthrene dyestuffs, and this property is utilized in various ways so as to produce white effects. If vat dyestuffs are added to such a reserve composition—for example, Indanthrene Yellow R with zinc oxide and anthraquinone—it is possible to fix this dyestuff in its proper shade by the simple passage of the printed merchandise through a dye liquor containing Indanthrene colors.

The alkali of the Indanthrene vat penetrates into the printing color and reduces the vat dyestuff by means of hydrosulphite, while the salts of manganese and of zinc contained in the reserve composition prevent the penetration of the vat dyestuff.

Still better results are obtained by adding concentrated hydrosulphite to the printing color paste, as well as a solution of potassium sulphite. The reduction of the vat colors which are contained in the reserve composition has already taken place in the printing paste, so that the subsequent dye, the leuco base, is dissolved by the alkali contained in the dye liquor and is carried in the most favorable state to fixation on the fiber. The reduction is accelerated by the addition of a small quantity of zinc chloride.

The fabric is, for example, printed with the following color composition: 500 grams of pure color, 100 grams of Indanthrene Yellow R (40 per cent concentration), 150 grams of zinc oxide paste (50 per cent concentration), and 180 grams of anthraquinone (30 per cent concentration). The pure color composition contains 450 grams of manganese chloride, 500 grams of water, 760 grams of British gum, 450 grams of kaolin (one to two) and 900 grams of zinc chloride. The printing composition may also be composed of 2,000 grams of pure color, 1,000 grams of Hydron Yellow G, 500 grams of anthraquinone, 250 grams of zinc chloride, 280 grams of hydrosulphite powder and 250 grams of potassium sulphite (40 deg. Be. concentration). (Bulletin de la Societe Industrielle de Mulhouse, 1927, pp. 134 and 135.)

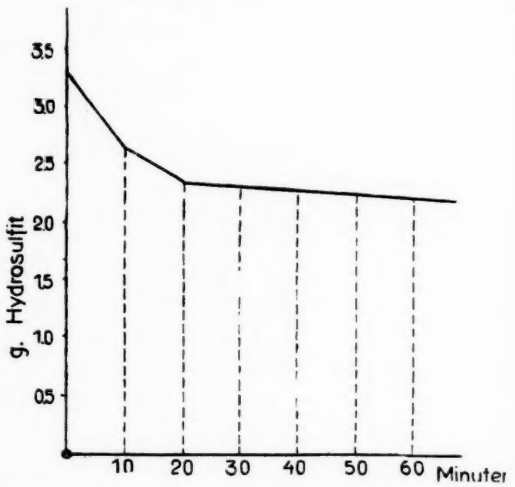
Determining Composition of Hydrosulphite Vat

The Methylene Blue-titanium trichloride titration method was first used for the purpose of determining the composition of the hydrosulphite vat. It was found that the reduced dyestuff acts in the same manner on the Methylene Blue, and hence the hydrosulphite and reduced dyestuff are determined together by this method. The ferric salt-titration method is carried out in similar manner, and hence will determine together both the hydrosulphite and the reduced dyestuff. If the dyestuff liquor is analyzed in this manner at intervals of ten minutes, a curve can be obtained which will represent the progress of the absorption of the dyestuff from the vat liquor.

Experiments were accordingly made with a mixture which contained 0.55 gram of Indanthrene Blue RSN, 12 c.c. of 40 deg. Be. concentrated sodium hydroxide, 2 c.c. of Turkey Red oil and 3.75 grams of sodium hydrosulphite.

The titrations were carried out on 10 grams of the liquor, which were added to 10 c.c. of a tenth normal solution of ferric ammonium sulphate. (This solution is made by dissolving 48.221 grams of the purest ferric alum in 1 liter of distilled water and is standardized when necessary by iodimetric titration.) Ten cubic centimeters of sodium acetate solution are added, as well as 0.1 gram of salicylic acid and 2 c.c. of glacial acetic acid. A deep violet-red solution is formed, which is then quickly back-titrated with the aid of a standard solution of sodium hydrosulphite. The change in color is accurate within a few drops and the solution is colored only a weak bluish shade from the oxidized dyestuff. The titration can be very well effected with this small amount of sample, and then the dyestuff is calculated from the results in the form of hydrosulphite.

The curve obtained in this experiment is shown herewith. As has been said, this curve shows the manner in which the dyestuff is being absorbed from the vat liquor. In order to afford control on this curve other experiments were carried out in which a solution of 5 grams of hydrosulphite and 12 c.c. of 40 deg. Be.



concentrated sodium hydroxide solution and 1 gram of Turkey Red oil per liter were allowed to stand in an open porcelain beaker at a temperature of 60 deg.

Cent., both with and without stirring. The stirring was carried out quite vigorously with a glass rod every five minutes. It has for its purpose the increase of the influence of atmospheric oxidation on the surface of the vat liquor, and the effectiveness of this oxidation can then be determined.

The results indicated that the reduction in the hydrosulphite content of the vat liquor, without cotton yarn or dyestuff being present in it, is very small and uniform. When just hydrosulphite is present in the liquor, then the addition of cotton yarn exerts an influence only through the dilution of the liquor, and hence the hydrosulphite content suffers a slight reduction at the beginning, while later on the reduction of the concentration of the salt becomes uniform. Stirring effects a slight increase in the reduction of the hydrosulphite content.

It has been found from experiments that the oxidation of a dye liquor on standing at a temperature of 60 deg. Cent. is equal to that of an alkaline hydrosulphite solution alone at the same temperature. In the former case the sharper drop of the curve must therefore be due to the fixation of the reduced vat dyestuff on the fiber. It is possible, therefore, to use a method which consists in the precipitation of the dyestuff with the aid of formaldehyde-acetic acid and titration of the formed sulphoxylate with ferric salt solution for the direct determination of the content of dyestuff in the liquor. When the total reduction value of a vat liquor is determined by titration with a solution of a ferric salt, and when the reduction value of the hydrosulphite present is also known, then the difference between the two figures will tell the reduction value of the vat dyestuffs present in the dye liquor. The dyestuff content can be calculated from the reduction value either with the aid of the formula of the dyestuff or by empirical testing for any commercial product. It is unfortunate that the molecule of the dyestuff is so large in comparison with the reduction value, so that the error, which is always incurred in making the tests, is multiplied, and hence the process does not possess a high degree of accuracy. (Melliand's Textilberichte, 1927, pp. 362-3.)

Vat Colors in Printing

Vat colors are insoluble in the normal state, but may be reduced to leuco-compounds which are soluble in alkalis, giving salts which possess a direct affinity for cellulose. When cellulose is treated with a solution of leuco-compound and is washed in acid, the free leuco-compound is liberated and on oxidation by suitable means, the original vat color is regenerated in an insoluble form. This is what happens during the application of vat colors, either by printing or dyeing.

Reducing the vat color by means of glucose in the presence of caustic soda gives good results, provided that the two factors of thickening and aging are carefully regulated. The aging process is capable of great variations, but the best conditions are the following: Air-free steaming, moist steam, temperature to be maintained at a constant point, which should not be too high, good circulation inside the ager to prevent formation of stagnant areas and good ventilation in the exhaust pipe. Aging has a great deal to do with the fastness of the vat color, and a safe rule in vat color printing is that full development of shade must be produced by aging, otherwise there will be irregularity.

Numerous practical difficulties exist in the production of vat color prints, and probably the printing itself is the process beset with the greatest number. Print colors are applied which contain large amounts of either caustic soda or carbonated alkali. This is a serious question, for the reason that back cloth upon which the actual cloth is printed, has to be considered. The color is developed on these cloths to a certain extent, and their bleaching is, on the other hand, a difficult matter. Washable cotton blankets are used, but here again the surface of the blanket is soon destroyed, and a very thorough washing apparatus has to be connected to the printing machine in order to get the blanket back in a clean and dry condition. Cotton blankets with a superficial layer of rubber have been tried, but these are not satisfactory, as the rubber is liable to peel or blister, and under the great pressure which is necessary to print fine patterns the surface is liable to be fractured. Blanket fabric entirely permeated by rubber is more durable and maintains its surface better.

A new development along these lines consists in having a rubber pressure bowl in the printing machine, and so eliminating all other fabric excepting the actual cloth printed. In this way the strongest alkaline colors can be safely applied. The superfluous color is removed from the rubber bowl before the fresh cloth reaches it by a spurt pipe, squeegee and a vacuum suction apparatus placed between the point at which the printed cloth leaves the bowl and that at which the fresh cloth first comes in contact with it.

The printing paste, especially when it contains strong caustic, will in the long run attack the copper roller, and small particles of copper may actually be removed. This may be due to a crystallizing action of the printing color at the point of contact of the roller and the steel doctor under the influence of heat or friction. The formation of small crystals of sodium sulphate may be the cause. The primary manifestation of the fault is the formation of fine streaks, and when such are produced with vat colors, it is very difficult to rectify the fault. It is suggested that the fine streaks may often be prevented by preparing the white cloth with a weak solution of Resist Salt L, a product which is primarily intended as a resist for vat colors.

Owing to the high resistance of most of the vat colors to such actions as soaping, chlorine and bleaching, it has been found impossible to discharge them all to a perfect white. Some are more or less affected by a leucotrope discharge, but it is possible to get a range of colors which

is hardly affected by this discharge. These may be printed upon dischargeable colors and in this way it is possible to produce very fast discharge styles. Vat colors may be applied on fabrics dyed with dischargeable colors, for example, woolen piece goods dyed with dischargeable acid or direct colors, natural silk goods similarly dyed and cotton piece goods dyed with dischargeable direct colors, or such azoic colors as Para Red or Naphthylamine Claret. (Journal of the Society of Dyers and Colorists, 1927, No. 4, pp. 110-114.)

Treating Artificial Silk

The appearance, strength and other properties of artificial silk made from regenerated cellulose are modified by treatment with the following swelling agents: Alkali hydrox, solutions of mercerizing strength; sulphuric acid of above 42 deg. Be. strength, phosphoric acid of specific gravity above 50 deg. Be.; hydrochloric acid of above 20 deg. Be.; nitric acid of above 35 deg. Be. strength; or mixtures of such acids including mixtures of nitric and sulphuric acids; concentrated salt solutions of above 50 deg. Be., and calcium sulphocyanide solution above 50 deg. Be., and copper oxide ammonia solution containing more than 0.3 per cent of copper.

To the swelling agent may be added substances that moderate its action, such as mono- and polyhydric alcohols, heterocylic bases, formaldehyde or ammonium salts. The treatment is preferably carried out at normal temperature; but temperatures below 0 deg. Cent. may be employed, while if a salt solution is employed the temperature may be raised to 100 deg. Cent.

The process is applicable to the treatment of spun, loose, woven, or made-up material, and the artificial silk may be alone or mixed with other fibers; it may also be applied to staple fiber. The material may be in the loose condition or under tension. The effect produced depends on the conditions; generally it comprises more or less loss of luster, a gain in translucency and transparency, a reduction in the stiffness of the material, and an increase in strength; with a mixture of nitric and sulphuric acids, the product may be non-translucent and lusterless or it may show a soft broken-up, lustrous effect resembling crepe, and materials treated in this way are advantageously denitrated.

In examples, silk is treated with soda lye of 20 deg. Be. strength at normal temperatures, or with sulphuric acid of 49 deg. Be. at minus 10 deg. Cent., or with nitric acid of 40 deg. Be. at normal temperatures, or with a nitrating mixture of 4 parts of sulphuric acid and 1 part of nitric, or with zinc chloride of 67 deg. Be. at a temperature of 40 deg. Cent. (British Patent No. 264,529.)

Bleaching Colored Woven Cotton Goods

In bleaching colored woven cotton goods the strength of the bleach liquor and the manner of its application will vary in accordance with the character of the dyestuffs that were used in dyeing the cloth. This, of course, refers particularly to the fastness of the color. The chloride of lime bleach is required only for the fastest colors, such as Turkey Red, Oxidized Black, many of the vat colors (Indanthrenes), and the like.

The first step in the process is to remove the sizing from the fabric, and then the latter is treated in a bath of chloride of lime of 0.6 deg. Be. concentration, and containing 2.2 grams of active chlorine per liter. Thereafter, it is treated in a chloride of lime liquor of 0.5 deg. Be. concentration, containing 2 grams of active chlorine per liter. In certain cases the goods must be boiled off again and then treated to another bleaching operation.

Goods which have been dyed with less fast colors, such as the Algols, Benzidine and some of the Helindon dyestuffs and the like, are first subjected to a desizing treatment, and then bleached with the aid of a 0.5 deg. concentration chloride of lime liquor for a period of forty-five minutes, and then well washed. Boiling-off then follows and the second bleaching with a liquor of 0.4 deg. Be. concentration. After washing, the goods are soured, treated with an antichlor and washed again.

Goods which have been dyed with colors that are not fast to boiling-off or bucking are again bleached with chlorine liquor, but in this case the strength of the chloride of lime liquor is approximately only 0.2 to 0.3 deg. Be. The final stage in the process is a thorough washing of the fabric. Dyestuffs which are decomposed by chlorine are again brought back to their original condition by a treatment of sodium hydrosulphite.

The chloride of lime liquors must not contain any undissolved particles of the chemical. The sodium peroxide bleach liquor possesses an essential advantage over the chloride of lime process in that it does not take as long to carry out and for this reason a greater production is secured. More brilliant and clearer shades are obtained. The bleaching is carried out in a liquor which contains 1 to 2 per cent of sodium peroxide; then the goods are soured by treatment with a solution of hydrochloride acid and finally washed.

A combination bleaching process is also described, which consists in treating the goods with a solution of chloride of lime of 0.2 deg. Be., which follows treatment in a weakly alkaline solution of sodium peroxide. Chloride of lime liquors are also used in a combination process with Activin. According to this process the well singed and desized fabric is preliminary bleached with a 0.5 deg. Be. concentrated chloride of lime solution, and then with a liquor containing 2 per cent of soda and 5 per cent of Activin. The duration of the treatment is one hour at a temperature of 65 deg. Cent. Then the fabric is washed and again treated with Activin and formic acid at a temperature of 30 deg. Cent. A faultless white fabric is thus obtained. (Zeitschrift fuer gesamte Textil-industrie, 1926, p. 556ff.)

Finishing Lining Materials

In finishing Milanaise only one side of the fabric is treated in the singeing machine. Then the colored, as well as the black fabric, is well desized and thereafter

subjected to as uniform as possible dyeing. Only dull shades are used in dyeing these fabrics, and substantive dyestuffs are almost exclusively used. Direct-absorbing, diazotized colors and Sulphur Black are used in special cases for producing black shades. In finishing the product, care must be taken to carefully differentiate between the process used on colored as well as on black linings.

In finishing the colored Milanaise lining, the fabric is treated in a sizing bath with a composition that is composed as follows: Eight kilograms of potato starch are dextrinized with 1 per cent of diastafor for ten minutes, and then mixed with 1 kilogram of curd soap and one-half a kilogram of cocoa fat. The whole is made up to a total volume of 100 liters. The sizing composition that is applied by means of the rollers is made up in the following manner: Five parts of potato starch are mixed with four parts by weight of cornstarch, one part by weight of curd soap, one-half a part of cocoa fat and one part of 50 per cent Turkey Red oil. The whole mass is then made into a volume of 100 liters, when the proportions are given in kilograms.

Black lining of this character is sized in the following manner: Eight kilograms of potato starch are dextrinized with ½ per cent diastafor for about ten minutes, and mixed with half a kilogram of curd soap, the same amount of cocoa fat and 2 kilograms of 50 per cent Turkey Red oil. Then 300 grams of crystallized haemetine are oxidized with 60 grams of sodium bichromate and 500 grams of sodium acetate (in the case of Sulphur Black), and all the ingredients are then brought up to a total volume of 100 liters.

In finishing pocketings the preliminary treatment in bleaching and dyeing is the same as has been described above. Inasmuch as pocketings are dyed only in lighter shades, it is not necessary to divide the fabrics into two classes, as in the aforementioned case, for finishing purposes. The sizing composition consists of 15 kilograms of potato starch, 15 kilograms of china-clay, ½ a kilogram of curd soap, 2 kilograms of Turkey Red oil and the color, the total making a volume of 100 liters with the required addition of water. All pocket-lining materials are processed on the left side, dried, pressed and then calendered. (Melliand's Textilberichte, 1927, pp. 358-359.)

THE TIENTSIN ALKALI PLANT

Plans were made some time ago to enlarge the soda ash plant of the Pacific Alkali Co. (Ltd.), also known as the Yung Lee Soda Co., at Tangku, Chihli, Province, China. Tangku is at mouth of the Hai Ho, on Gulf of Chihli, to the southeast of Tientsin. These plans have been laid aside for the present and will not be taken up again until economic and political conditions become more settled in North China. About eight years ago this firm purchased machinery and equipment in the United States for the purpose of establishing a capacity of 65 tons of soda ash per diem. Through error in the specifications some of the drying and other equipment is inadequate to the production of the rest of the plant, with the result that the capacity of the plant reached only 40 tons per diem. Any enlargement of the Tangku Plant will be of a nature to increase the capacity of the present inadequate units thereby increasing the daily production of the plant to the originally planned 65 tons. This information is contained in a dispatch from Consul D. C. Berger, Tientsin.

The Pacific Alkali Company states that under normal conditions it can compete very profitably with imported soda ash, but at present, as during the past two years, unsettled political conditions have caused it to be taxed heavily. At present for the purpose of avoiding any further taxation, the daily output of the Tangku Plant has been reduced to 30 tons. The products manufactured at the Tangku Plant are sodium carbonate, sodium bicarbonate, sodium hydroxide and allied products.

ITALIAN DYE INDUSTRY UNIFIED

The Fabbriche Italiane Materie Coloranti Bonelli announces that an agreement has been reached with the S. I. P. E. Congio, the Italica, the Schiapparelli and the Unione Produttori e Consumatori di Materie Coloranti Artificiali, covering production and sales of intermediates and dyes.

The capital of the Bonelli company has been increased from 45,000,000 lire to 60,000,000 lire, which enables them practically to absorb the Italica. Large amounts of French capital are reported to be invested with the controlling shares said to be in the hands of the Societa Italiana del Gas of Turin.

The object of the agreement is to expand production and do away with competition. The Unione Colori is the organization which was handling German dyestuffs on account of reparations.

INTERNATIONAL TRADE IN CAUSTIC SODA

Prior to the outbreak of the World War, the alkali trade in the world was controlled to a large extent by British manufacturers. The United States at that time was not an important factor in the alkali export trade, but has since become of considerable importance. In fact, the 1926 exports of caustic soda from the United States were equivalent to approximately 60 per cent of the quantity shipped from Great Britain. Current British exports, however, are considerably above shipments in 1913. Whereas, both Great Britain and the United States show slightly increased export trade during 1926, as compared with the previous year, Germany, according to estimates, has more than doubled its trade, and France, an important factor in the world trade in this commodity, appears to have lost a large share of the 1926 foreign

trade. For comparative purposes the exports of the four countries mentioned are shown in the following table:

Exports of Caustic Soda

Exported from—	1925, Pounds	1926, Pounds
Great Britain	185,904,624	186,144,224
United States	100,954,500	103,294,775
France	97,238,055	60,000,000*
Germany	16,991,297	36,000,000*

*Estimated.

SURVEY OF WORLD CHEMICAL INDUSTRY ISSUED

A comprehensive memorandum on the chemical industry has been issued as part of the documentation of the International Economic Conference, which was in session at Geneva during May. The document was prepared by the Economic and Financial Section of the League of Nations from information furnished to it by governments, by members of the Preparatory Committee for the conference and by industrial organizations, which prepared memoranda at the request of members of the committee.

The salient phases of the subject and its international aspects are examined from this mass of information, and the statistical tables and summaries, as a consequence, are the most comprehensive, authentic and up to date available.

The memorandum is obtainable from the American agent for publications of the League of Nations, World Peace Foundation, 40 Mount Vernon Street, Boston, Mass. The price is $1.00.

NATURAL AUTUMN COLORS ON FALL COLOR CARD

Burnished copper-tinted browns, yellow tans, dull greens and deeper shades of red all form the color theme for fall wear, according to Margaret Hayden Rorke, managing director of the Textile Color Card Association, commenting on the new fall card issued by the association and comprising eighty shades for fabrics and millinery.

Copper tints and dark mahogany tones are prominent in the varied range of shades selected for the 1927 fall card. Twelve shades are grouped together as "Autumn Leaves," and include the bloomy reds, browns and yellows of an October landscape. Under "Opera Tints" are assembled twelve evening shades: light pink, lavender, blue, green and yellow. The remaining fifty-six colors are arranged in two, three and four toned shadings, adapted by the composé effects now in vogue.

There are slight variations on the shades and tints that composed last year's autumn card. The claret shades are slightly brighter. There are deep terra-cotta tints and bright vermilions, and three new copper shades known as Cherokee, Chinook and Terra Gona.

Yellow beige, a straw shade, is added to the list of beige tones, several of which are repeated on the fall 1927 card. Silver grays, such as Gull and Crane, also reappear on the card. Various ranges of blue include Venezia and Napoli, deep turquoise shades and bright Indigos called Directoire and Napoleon.

Among the evening colors are Ibis Pink, Liqueur Green, a light yellow green, and Opera Mauve, an orchid tint of rosy cast. Copperleaf, a burnt sienna tint; Autumn Glory, a reddish orange; Amberglow, an old gold; Flaming Maple, a scarlet, and Laurel Oak, a rich brown, are among the "Autumn Leaves" series for sport wear. Jade and silver greens, soft browns and old rose shade also make up the list of colors for the autumn season.

NEWPORT ANNOUNCES NINE IMPORTANT NEW COLORS

Attractive leaflets with swatches attached have been issued by the Newport Chemical Works, Inc., describing the properties of nine different colors recently developed in its laboratories and issued under the names of Anthrene Violet BNX Paste, Newport Chrome Red A4B, Newport Fast Light Yellow 3G, Newport Direct Fast Scarlet 4BAN, Newport Direct Fast Blue 4GL, Newport Direct Fast Yellow 4GL, Newport Direct Fast Black WCT, Acid Anthraquinone Blue B and Acid Anthraquinone Blue SE.

The new Anthrene color, a Violet BNX paste, is described as particularly noted for its excellent leveling properties and its fastness to water spotting. It is said to be distinguished by excellent general fastness, especially to light, chlorine, washing and steaming, and its greatest value is for dyeing cotton and rayon for self-shades as well as for combinations.

The Newport Chrome Red A4B is a color for wool and silk, described as having excellent fastness on these fibers. It may be dyed from neutral, acid or chrome baths by the chromate chrome bottom or after-chrome methods. Bright scarlet shades suitable for buntings are obtained from neutral or acid baths. It is suitable for direct printing on wool or silk, and is said to be dischargeable.

As an Acid Yellow suitable for the dyeing of carpet yarns, dress goods, upholstery fabrics, felts, fur hats, etc., the third color, Newport Fast Light Yellow 3G, is described as also being suited to the dyeing of pure and tin-weighted silks. It is claimed to discharge white.

Newport Direct Fast Scarlet 4BAN is described as a brilliant scarlet of value for dyeing cotton, rayon and pure silk, and as possessing good fastness properties, especially to acids, alkali, light, perspiration and hot pressing.

The new Direct Fast Blue 4GL added to the Newport line is, according to the announcement, particularly suitable for use as a self-color for the production of bright blues and in combination for greens, slates

and other mode shades on plushes, upholstery, draperies, etc., made from either cotton or rayon. It is said to possess excellent fastness to light and level dyeing properties.

Also described as useful for the dyeing of cotton piece goods, upholstery, plushes, etc., either as a self-color or in combination with similar colors for bright greens, oranges, tans, etc., Newport Direct Fast Yellow 4GL is said further to be distinguished by its pure greenish tone and its excellent fastness to light, leveling and penetrating properties. It is also said to be of value for dyeing weighted silk from neutral baths.

The leaflet dealing with the properties of Newport Direct Fast Black WCT states that this color is specially designed for leaving Celanese effects clean in fabrics of cotton and Celanese and rayon and Celanese. It is level dyeing, according to the description, and has very good fastness to light and rubbing and moderate fastness to washing.

The two Newport Anthraquinone Blues, SE and B types, are both described as distinguished by excellent fastness to light, level dyeing properties and pure shade. They are used for dyeing light and medium blues and for combining with similar acid colors for slates, greens, drabs and fancy shades on carpet yarns, plush, dress material, hat felts, etc.

NEW FAST BLUE AMONG PONTAMINES

A color that is said to be similar to other members of the series of Pontamine Fast Blues but decidedly greener in shade has been developed and placed on the market by E. I. du Pont de Nemours & Co., under the name of Pontamine Fast Blue 6GL. It is useful not only as a self-color, according to the announcement, but for shading other blues to a greener tone. Although not as fast to light as Pontamine Fast Blue 4GL, this new blue is a color to be used for delicate and medium shades, such as those obtained with sky blues of the same series.

In speck dyeing, Pontamine Fast Blue 6GL is said to leave animal fibers practically unstained, but when union-dyed the wool is stained slightly and half-silk dyed neutral at the boil results in the cotton being dyed and the silk left practically white in dyeings up to 1 per cent strength. Celanese-effect threads are also left white, it is claimed. The color is dyed like other direct blues with an addition of Glauber salt.

The Colfax Dyeing Company, recently organized at Paterson, N. J., with a capital of $50,000 to operate a textile dye works, will be represented by Joseph S. Kelly, 159 Marshall Street, Paterson, one of the incorporators.

Charles Krebbs has taken the position of overseer of dyeing for the Fairmont Dye Works, Woonsocket, R. I.

FILTERS FOR ACID FILTRATION ARE DEVELOPED BY DU PONT

The secret of preparing nitrated cotton cloth for the filtration of acid solutions has been solved by Du Pont chemical engineers, according to a booklet just issued by E. I. du Pont de Nemours & Co. describing the properties and uses of the new Resisto-Filters for acid filtration.

These filters are of about the same thickness and texture as ordinary cotton filtration cloth, according to this description, but have a harder surface, from which the press cake is easily detached. It is further claimed that tests conducted over a long period on a press used solely for filtering 30 per cent sulphuric acid at atmospheric temperatures have shown that these filters have a life considerably longer than good-grade woolen cloth or camel-hair filters. They find use in the synthesis of organic intermediates from naphthalene, the naphthols and the naphthylamines, such as the sulphonation of naphthalene to the beta-naphthalenesulphonic acids and of beta-naphthol to R and G salts.

HONOR STUDENT AT CAROLINA TEXTILE SCHOOL

Franz E. Plummer, of Selma, Ala., a senior in the Textile School at North Carolina State College, will deliver the valedictory address at the commencement exercises this week. Mr. Plummer has been an outstanding student and, in addition to winning scholastic honors, he has done creditable work in other phases of college life.

The Student's Medal, awarded annually by the National Association of Cotton Manufacturers, has been won by Mr. Plummer. The medal is presented to the textile student showing the greatest proficiency in his work. Presentation of this medal will be made during commencement.

After graduation Mr. Plummer will go to Lynchburg, Va., where he has accepted a position in the cost department of the Consolidated Textile Corporation.

The Southern Dyeing Company, Burlington, N. C., dyers and bleachers of cotton and rayon yarns, has almost completed the removal of its equipment from its old plant. In its new quarters the company has 26,000 square feet of floor space. New equipment installed includes a 500-pound Franklin dyeing machine, a Craig-Hornbuckle combination beam and package dyeing machine, twelve Universal tube winders, and two high speed Universal cone winders. Production of the Southern Dyeing Company has been doubled, amounting now to 40,000 pounds of cotton and rayon yarns a week.

International Dye Trade

EDUCATING CHINESE DYE CONSUMERS

Indicative of the importance which the Chinese attach to trade-marks or "chops," the two long established and well-known German trade-marks or "chops" under which German synthetic Indigo has been marketed in China are so well established in the minds of the Chinese that they command a price of 15 per cent higher than the Indigos marketed by American dye manufacturers and which scientific chemical analysis proves to be fully equal in quality to the German products. In other words, it is requiring years of patient pioneer work on the part of American dye manufacturers to establish their dyes in competition in this market with the German products. The American dyes, according to Commercial Attache Julean Arnold, Shanghai, are gradually receiving recognition as evidenced by the fact that more recently introduced Swiss and French Indigos sell at still lower prices. The persistence shown by the Chinese in refusing to recognize more recently introduced products as on a basis of equality with the old-established "chops," is probably greater than that characteristic of people in the West who have better means or differentiating in qualities than have yet been developed in China.

NEW AZO DYES IN ENGLAND

A new patent for improvement or modification describes the manufacture of new azo dyestuffs suitable for printing on cotton with mordants, particularly chrome. Specifically the patent is for the manufacture of azo dyes by diazotizing 1-Amino-2-hydroxy-3-carboxynaphthalene-6-sulphonic acid and coupling the diazo compound with sulphonated mono- or di-hydroxynaphthalene. The dyestuffs so obtained are stated to be dark red powders yielding red to violet solutions in water and combining readily with metallic mordants. The shades when printed on cotton range from reddish-blue to bright greenish-blue and are claimed to be suitable for wool. (Trade Commissioner H. S. Fox, London.)

DYE CONSUMPTION IN SMYRNA

Germany to-day dominates the local market for dyes, and supplies practically all the alizarine dyes used in the extensive manufacture of rugs in Anatolia. The colors mostly in demand are green, blue, yellow, about fifteen shades of red, small amounts of orange and blacks, according to advice from the Bureau of Foreign and Domestic Commerce. The total importations are estimated at about 20,000 kilos. No official figures are available. More than half the woolen yarns are dyed in Smyrna and forwarded to the interior. Attempts to introduce British and Swiss dyes have met with difficulty. It is expected that the transfer to Athens of a large number of Greek and Armenian rug weavers will result in an increased demand for dyes in Greece on account of the growing production of rugs.

DYEING AND DYESTUFFS IN BRADFORD, ENGLAND

During the first quarter of 1925, the Bradford Dyers' Association (Ltd.) report success in the manipulation of dyes with respect to the union of artificial silk with cotton and wool fibers and natural silk, says a report from the Department of Commerce. Samples of fabrics in which cross dyeing and weaving have been incorporated are being shown in London. Artificial silk is combined in woven colored dress goods and brocades in wool and cotton, and some novel stripe and check effects have been obtained. From a technical viewpoint British dyestuffs production has undoubtedly made good progress during the first three months of 1927. The newer colors produced have greater fastness, such as the chrome and pyrazolone dyes as well as derivatives of Indigo, anthraquinone, benzanthrone, and perylene. Progress is being made in manufacture of vat colors and in cellulose and acetate dyes.

INCREASE IN BASLE'S ANILINE DYE TRADE

Consul C. M. Hatch of Basle reports that although there was a slight decrease in the exports of dyes from Basle to the United States in 1926, there was a substantial increase to other countries. The total exports to all countries in 1926 were 59,365 quintals, valued at 57,040,215 francs, compared to 49,350 quintals in 1925, valued at 52,130,426 francs. Exports to the United States in 1925 were 1,348,550 pounds, valued at $1,579,722, against 1,320,154 pounds in 1926, valued at $1,344,320. Manufacturers claim the increase in quantity was counterbalanced by price reductions, keen competition, and import difficulties imposed by foreign countries. Trade with Germany in 1926 was more than double 1925 in value.

INCREASE IN DYE IMPORTS AT YUNNANFU, CHINA

The imports of dyes and pigments increased from $249,486 in 1925 to $432,588 in 1926, an increase of almost 80 per cent. About 95 per cent of the imports consisted of artificial Indigo. The number of pounds of artificial Indigo imported in 1926 was 565,467 pounds, as compared with 254,266 in 1925. The quantities are about equally divided between liquid or paste and dry Indigo. Germany shipped by far the largest amount, a small part being from Switzerland. One French firm which had been handling French dyes exclusively, ceased altogether to carry stock. Most of the dyes come to Yunnan from Hongkong. (This information comes from the Department of Commerce through Consul J. E. Jacobs, Yunnanfu.)

MILLS AND MEN

The American Yarn & Processing Company, Mt. Holly, N. C., spinners and mercerizers of cotton yarns, has installed and put into operation equipment for bleaching cotton yarns.

At Poughkeepsie, N. Y., Lawrence-Morley Textiles, recently noted incorporated with capital of $100,000, has succeeded to the business of the W. A. Lawrence Manufacturing Company, 170 Parker Avenue, where they will manufacture silk, rayon and cotton fabrics for underwear, corsets and brasieres; also silk and rayon underwear. A finishing plant will be added. W. O. Lawrence is president and treasurer of the new company.

Bert Eby, superintendent of the finishing department of the Century Beverly Corporation, Pottstown, Pa., has resigned and accepted the position of superintendent of the bathing suit department of Penman's, Ltd., Paris, Ontario, Canada.

R. T. Grant, Southern representative of the United Chemical Products Company, is reported quite ill at his home in Myers Park, Charlotte, N. C.

The Sturbridge Printing & Finishing Company, Fiskdale, Mass., has been incorporated with a capital stock of $25,000 to operate the Sturbridge Finishing Company, owned by the Golding Bros. Company, Inc., New York. The temporary officers are: President, George H. Mirick, Worcester, Mass.; treasurer and clerk, Douglas Whitcomb, Worcester; vice-president, Josephine M. Lindsay, Millbury, Mass.

I. L. Langley, a graduate of the Textile School of the North Carolina State College, class of 1923, has been appointed head of the Cost Department of the Consolidated Textile Corporation, Lynchburg, Va., succeeding George W. Duncan, who has become associated with the Cotton Textile Institute. Mr. Langley holds both a Bachelor's and Master's degree in Textile Manufacturing from the North Carolina State College. He is a lecturer on Cost Accounting for the Textile School and conducts a series of lectures annually at the school.

The Pen-Co Hosiery Company, of Burlington, N. C., to manufacture men's hose, is the sixth new hosiery manufacturing plant to be established there since the first of the year. John M. Coble, coca-cola bottler and capitalist of this city, and Ernest Pennington, prominent business man, are the chief stockholders. The plant will be established in the loft of the Coca-Cola Building.

A charter has been granted to the Liberty Fabrics Corporation, of Union, S. C., manufacturers of silk fabrics and women's silk underwear, with capital of $350,000, fully paid in. The firm has taken over the business of the Liberty Fabrics Corporation, of Brooklyn and Tonowanda, N. Y., and both plants will be moved here about June 1, when the new building is expected to be completed.

John F. Tinsley, vice-president and general manager of the Crompton & Knowles Loom Works, Worcester, Mass., will be one of the speakers at the second Industrial Institute of Massachusetts University Extension to be held at the Massachusetts Agricultural College, Amherst, Mass., July 5-15.

A dividend of $10,980 or 3½ per cent on $360,000 preferred stock was declared at the annual meeting of stockholders and directors of Drayton Mills, of Spartanburg, S. C., it was learned from Ben W. Montgomery, president of the mill. Mr. Montgomery was re-elected president, Gabriel Rouquie was re-elected secretary and treasurer, and A. T. Greene was appointed assistant treasurer of the plant. This is a promotion for Mr. Greene. Drayton Mills, which manufactures fine lawns and fancy goods, has 842 looms and 44,800 spindles. Steam power is used.

W. E. Thatcher, of New York, was elected treasurer of the Standard Textile Products Company, succeeding Henry M. Garlick, resigned. Mr. Thatcher was formerly secretary and assistant treasurer.

The National Dye Works, Inc., of Burlington, N. C., recently reported as enlarging its plant, plan the following improvements: New steam plant, five 150-h.p. boilers; new addition to finishing plant of 30,000 square feet for providing space for increased production, cost $135,000.

ORGANIC COLORS FOR RUBBER

Until comparatively recently, the only practicable method of obtaining satisfactory colors on heat cured rubber was to use inorganic pigments. To-day quite a range of organic colors are used in England that have been found particularly suitable for this use, reports the U. S. Department of Commerce Chemical Division. Two groups of organic colors are used, viz., soluble in water and insoluble in water. Soluble colors are used first to form a lake color while the insolubles are mixed directly into the rubber. As the nature and quality of rubber differs widely with the different ingredients in accordance to its use, it is necessary to select colors for particular purposes. The best results are claimed with organic colors in press cured rubber.

The Hoffner Silk Dyeing Company, Philadelphia, which has leased the entire first floor of the building owned by John Hamilton & Son, at Howard and Huntingdon Streets, will have over 11,000 square feet of floor space in the new quarters. The company will have a capacity of over 4,000 pounds of rayon yarns daily.

James A. Irvine has been appointed employment manager of Cheney Brothers, South Manchester, Conn. Mr. Irvine was formerly in charge of the educational department. J. P. Lamb, who was in charge of employment, will devote himself exclusively to the company's statistical work.

Andrew J. Kelly has been appointed analytical chemist for the Burkart-Schier Chemical Company, Chattanooga, Tenn., manufacturing chemists. He is a graduate of Charleston College and an experienced textile man, and will doubtless prove a valuable addition to the company's staff. E. L. Fletcher has been promoted to the position of chief chemist of the Burkart-Schier Company.

Dr. Thomas Nelson, dean of the Textile School, North Carolina State College, announces that this year he has had more requests for textile graduates than ever before, and there are not enough men in the present senior class to supply all these requests. Every year more mill executives are taking textile graduates into their mills and training them for positions of responsibility, and Dr. Nelson says that in his opinion the textile industry offers a young man more opportunities for advancement than any other industry in the South.

The Little Rock Textile Company, of Little Rock, Ark., recently incorporated, has purchased a tract of land in the eastern section of the city as a factory site for $10,000. The company is capitalized at $50,000, and C. V. Hoke is president, and Manette Hoke, secretary. Officials of the company announced that work on the new plant will be started at once and rushed to completion. The company will engage in the manufacture of cotton cord, twine, rope and other cotton products.

The Thies Dyeing & Processing Company of North Carolina, Belmont, N. C., which recently awarded contract to Brown-Harry, Inc., Gastonia, N. C., for erecting a one-story and basement, 218 by 143 feet, plant of red brick construction, expects to have the building completed within two months. This new plant will have a dyeing and bleaching capacity of over 120,000 pounds per week on tubes, cones and beams. J. E. Sirrine & Co., Greenville, S. C., are the engineers in charge.

Patrick Birmingham completed fifty-four years of consecutive service for the Draper Corporation, Hopedale, Mass., on May 12, and was presented with several gifts from his associates.

Dennis Rainsville, formerly boss finisher for James and E. H. Wilson, Inc., Pittsfield, Mass., now out of business, has accepted a position in Proctorsville, Vt.

Thomas Goulding has taken the position as overseer of dyeing in the plant of the Merrimack Woolen Corporation, Dracut, Mass.

As part of its new expansion program, the Alsop Engineering Company, maker of Hy-Speed machines, has taken over an entire floor of the Hartford Building, at Broadway and Sixty-third Street, New York City, for sales offices, display rooms and the shipment of special orders. A complete line of vacuum bottle fillers, portable electric filter tanks, liquid measuring pumps, glass-lined tanks and other units for the manufacture of liquid products is now on display in the newly fitted display room.

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i. e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

DYER WANTED

A California dyeing plant, the only one of its kind on the Coast, needs a dyer who understands the dyeing and finishing of new materials, as well as redyeing and converting for resale. He should be able to take full charge, secure results and grow with the business. An unusual opportunity. Address Classified Box 391. American Dyestuff Reporter.

OVERSEER OF DYEING

A man who has had charge of cotton piece goods dyeing, bleaching, mercerizing and finishing at some of the leading bleacheries of the country desires a similar position. Thoroughly familiar with all classes of cotton dyeing (including vats) in all types of machines. Best of references. Address Classified Box 395, American Dyestuff Reporter.

SKEIN DYER

Wanted—Capable dyer on rayon skeins, experienced in direct dyeing, by a rayon and silk processing firm in the New York district. Textile school training will be an asset, but is not essential. Address Classified Box 405, American Dyestuff Reporter.